URBAN WATER MANAGEMENT PLAN 2005

Fair Oaks Water District

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Executive Summary

The California Urban Water Management Planning Act of 1983 requires urban water suppliers to develop an Urban Water Management Plan. An Urban Water Management Plan describes the water demands and quantifies the water supplies that are available to an urban water supplier during normal and dry conditions. Urban Water Management Plans are required to be updated in years ending in zero and five. The Fair Oaks Water District's (District) 2005 Urban Water Management Plan (Plan) is included herein.

This Plan ensures that the appropriate level of water supply reliability is sufficient to meet the water needs of customers during normal, single-dry, or multiple-dry years. The Plan focuses on specific issues unique to the District's service area. The Plan has been prepared in compliance with the requirements of the Act, as amended to 2005, and includes the following discussions:

- Water District Service Area
- Water System Facilities
- Water Sources and Supplies
- Water Quality Information
- Water Reliability Planning
- Water Use Provisions
- Water Demand Management Measures
- Water Shortage Contingency Plan
- Water Recycling

The District's water supply includes surface water treated by San Juan Water District and groundwater from the North Area Groundwater Basin (Basin) managed by the Sacramento Groundwater Authority. Over the past several years, the District has averaged approximately 13,890 acre-feet in water sales to a service area population of about 39,500. Most of the District's water demand is met with surface water from the American River under the conditions of an agreement with San Juan Water District for the delivery of 15,000 acre-feet of water per year. Over the next 25-year planning period, water demands are anticipated to remain relatively constant with a slight increase due to a projected increase in population to approximately 41,200 people. The District will continue to meet its future demands with surface water and groundwater supplies.

Protection of the quality of water supplies is a top priority. The quality of the District's water supplies meets or exceeds state and federal standards. The District has been fortunate to have exceptionally good surface water and groundwater resources in the past; however, recognizes the threat of contamination on its water supplies especially from trichloroethere (TCE) and to a lesser extent, perchlorate and NDMA in the groundwater. The District's water management strategy related to the threat of groundwater contamination includes collaboratively working with the responsible party, Aerojet, and regulatory agencies to install groundwater extraction and treatment facilities to treat and contain the TCE plume. The District will also continue its involvement on the Groundwater Contamination Committee, through the Sacramento

Groundwater Authority, to increase the awareness of groundwater contamination and the effects it would have on future drinking water supplies. Aerojet's current remediation plan includes water quality monitoring and the installation of two groundwater extraction wells with a treatment capacity of 2,000 gallons per minute. This treated groundwater may be available to the District in the future as a source of water supply.

Reliability is a measure of a water service's system expected success in managing water shortages. The combination of demand management and supply augmentation options help to reduce the frequency and severity of shortages. The District and the regional water agencies have implemented a variety of programs to ensure reliability through diversity of supply. Such programs in the region include the implementation of the American River Basin Conjunctive Use Program; development of the Integrated Regional Water Management Plan; implementation of the Water Forum Agreement; implementation of the Central Valley Regional Water Quality Control Board Basin Plan; enhancement of conservation programs; and the development of additional local supplies such as groundwater and remediated groundwater to optimize the beneficial uses of ground and surface waters.

The District recognizes water use efficiency as an integral component of current and future water strategy for its service area due to growing competition for limited supplies, and increasing costs and difficulties in developing new supplies, among other factors. The District is signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California. The District actively implements the 14 conservation best management practices through programs, regulations, resolutions, and the use of devices such as equipment and facilities that provide a significant reduction in water demand.

Finally, the District has implemented a Water Shortage Contingency Plan to reduce water demands during water shortage emergencies. The Water Shortage Plan is formalized through Resolution No. 0109 (2001) establishing five stages of action, and is designed to provide a minimum 50 percent of normal supply during a severe or extended water shortage. If surface water supplies are reduced during a drought condition, the District is prepared to utilize its critical groundwater sources. The District will also work with the San Juan Water District which guides the management of regional surface water supplies in both surplus and shortage conditions.

The District's 2005 Plan demonstrates planning efforts in coordination with San Juan Water District and other regional agencies that ensure reliability of a sufficient supply of water to meet the needs of the District's customers during normal, single-dry, or multiple-dry years. The water reliability analysis included in Section 4 shows that the District will maintain a surplus of water supply above demands of approximately 68 percent in normal years, single-dry years, and multiple-dry years through 2030. The results indicate that the District can expect to meet all of its water demands over the next 25 years for normal, single-dry, and multiple-dry years.

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Acronyms

ACT	California Water Management Planning Act of 1983
AB	Assembly Bill
AFB	Air Force Base
ARBCUP	American River Basin Conjunctive Use Program
AROG	American River Operations Work Group
BMP	Best Management Practices
CALFED	California Water Policy Council and Federal Ecosystem Directorate
CCR	Consumer Confidence Report
cfs	Cubic Feet per Second
CII	Commercial, Industrial, Institutional
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
DCA	Dichloroethare
DCE	Dichloroethere
DHS	California Department of Health Services
DMM	Demand Management Measures
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EOP	Emergency Operations Plan
ETo	Evapotranspiration
EWA	Environmental Water Account
FMS	Flow Management Standards
gpm	Gallons per Minute
IRWMP	Integrated Regional Water Management Plan
LGA	Local Groundwater Assistance
LUST	Leaky Underground Storage Tanks
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter
mgd	Million Gallons per Day
MOU	Memorandum of Understanding
MTBE	Methyl Tertiary-Butyl Ether
NDMA	n-nitrosodimethylamine
NPDES	National Pollutant Discharge Elimination System
OCAP	Operations Criteria and Plan
OEHHA	Office of Environmental Health Hazard Assessment
PCE	Tetrachloroethere
pCi/L	Picocuries per Liter
RWA	Regional Water Authority
RWMP	Regional Water Management Plan
RWQCB	Central Valley Regional Water Quality Control Board

Acronyms (Continued)

SACOG	Sacramento Area Council of Governments
SAFCA	Sacramento Area Flood Control Agency
SB	Senate Bill
SGA	Sacramento Groundwater Authority
SJWD	San Juan Water District
SRCSD	Sacramento Regional County Sanitation District
SRWRS	Sacramento River Water Reliability Study
SRWTP	Sacramento Regional Wastewater Treatment Plant
SWRCB	State Water Resources Control Board
TCE	Trichloroethere
TDS	Total Dissolved Solids
THM	Trihalomethanes
WTP	Water Treatment Plant
µg/L	Micrograms per Liter
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency

Section 1 – Introduction

This Urban Water Management Plan Update (Plan) serves as a long-range planning document for water supply to the Fair Oaks Water District (District). The District provides water to over 13,500 service connections and is considered a California special district providing retail sale of potable water. This section provides an overview of the Plan, the preparation including agency coordination, and public participation to complete the updated Plan.

Purpose and Urban Water Management Plan Summary

The purpose of a Plan is to ensure that the appropriate level of water supply reliability is sufficient to meet the needs of a water purveyor's customers during normal, single-dry, and multiple-dry years. The California Water Management Planning Act of 1983 (Act), as amended, requires urban water suppliers to develop a Plan every five years in the years ending in zero and five.

The legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of an Urban Water Management Plan is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The District's 2005 Plan has been prepared in compliance with the requirements of the Act, as amended to 2005[1] (Appendix A), and includes the following:

- Water District Service Area
- Water District Facilities
- Water Sources and Supplies
- Water Quality Information
- Water Reliability Planning
- Water Use Provisions
- Water Demand Management Measures
- Water Shortage Contingency Plan
- Water Recycling

[1] California Water Code, Division 6, Part 2.6; §10610, et. seq. Established by Assembly Bill 797 (1983).

Urban Water Management Plan Update Preparation

The District's 2005 Plan updates its 2001 Plan and incorporates changes enacted by recent legislation including Senate Bill (SB) 610 (2001), Assembly Bill (AB) 901 (2001), SB 672 (2001), SB 1348 (2002), SB 1384 (2002), SB 1518 (2002), AB 105 (2004), and SB 318 (2004). The Plan also includes water use efficiency efforts that the District has implemented or is considering implementing pursuant to the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU).[2] The District became signatory and adopted the MOU on May 11, 1998.

The sections in this Plan correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the District. The Department of Water Resources' Review for Completeness form has been completed, which identifies the location of Act requirements in this Plan, and is included as Appendix B.

Agency Coordination

Development of the District's 2005 Plan was coordinated with San Juan Water District (SJWD), which serves as the District's wholesaler of surface water. The District is dependent on SJWD for its long-term surface water supply from the American River. The District is considered part of the San Juan Family in conjunction with Citrus Heights Water District, Orange Vale Water Company, and the City of Folsom.

Notification of the District's intention to prepare this Plan was sent to Sacramento County and the Cities of Folsom, Rancho Cordova, and Citrus Heights. Other agencies were notified or contacted for information relevant to the preparation of the Plan as shown in Table 1 on the following page. In addition to coordinating with these agencies, numerous references were used to develop this Plan as shown in Appendix C.

The 2005 Plan is intended to serve as a general, flexible, and open-ended document that periodically can be updated to reflect changes in water supply trends, and conservation and water use efficiency policies. This Plan, along with the District's proposed water master plan and other District planning documents, will be used by District staff to guide water use and management efforts through the year 2010, when the Plan is required to be updated.

[2] The *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) was adopted in September 1991 by a large number of water suppliers, public advocacy organizations, and other interested groups. It created the *California Urban Water Conservation Council* and established 16 Best Management Practices (BMPs) for urban water conservation, recently refined to 14 BMPs.

Table 1 – Coordination with Appropriate Agencies

	Sent Notice of Preparation of Plan	Contacted for Information	Sent Notice of Intention to Adopt	Received a Copy of the Draft Plan	Commented on the Draft Plan	Attended Public Meeting[1]
City of Citrus Heights	X					
City of Folsom	X					
City of Rancho Cordova	X					
Regional Water Authority	X					
Sacramento County	X					
Sacramento Groundwater Authority	X					
Regional Water Quality Control Board	X					
Water Forum	X					
Arden-Cordova Water Service	X					
Carmichael Water District	X					
Citrus Heights Water District	X	X				
Orange Vale Water Company	X					
Sacramento Suburban Water District	X					
San Juan Water District	X	X				
Fair Oaks Chamber of Commerce	X					
Fair Oaks Community Planning Advisory Council	X					
Sacramento Regional County Sanitation District		X				

[1] The District held a public workshop to explain the Plan and address any questions and/or comments prior to the public hearing. An "X" in this column indicates the agency attended the public workshop and/or the public hearing.

Public Participation and Plan Adoption

The Act requires the encouragement of public participation and a public hearing prior to the adoption of the 2005 Plan. In order to reach the "*diverse social, cultural, and economic elements of the population"* within the District's service area, the District provided notice of a public workshop and public hearing to the neighborhood paper, the Fair Oaks Today, and the Sacramento Bee.

The 2005 Plan was presented to the public on December 1, 2005 at a public workshop. The public workshop provided an opportunity for the District's customers, residents, and employees in the service area to learn about the District's water supply and the plans to continue providing reliable, safe, and high-quality water into the future. The workshop also allowed people to ask questions regarding the current situation and the viability of future Plans.

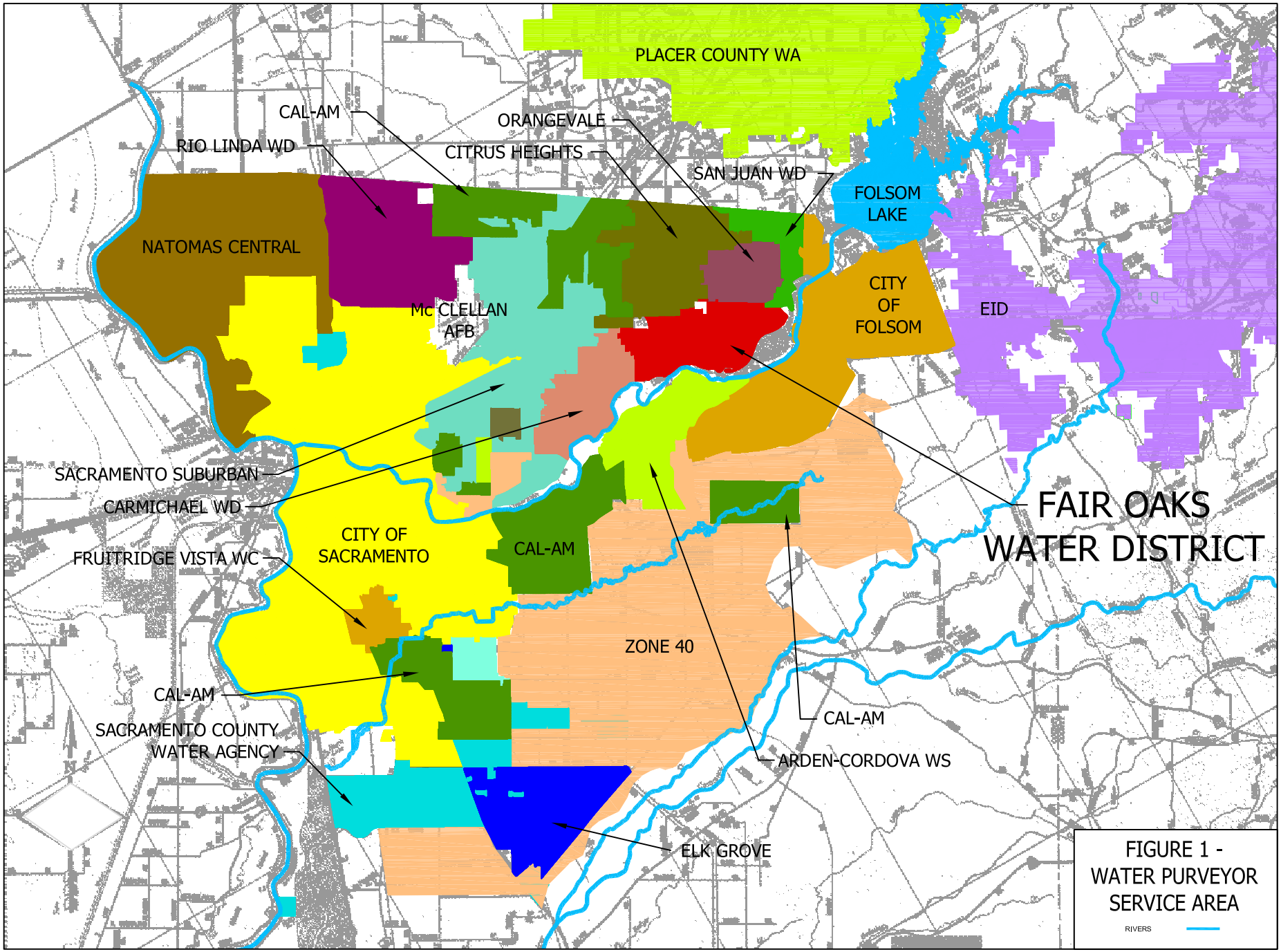
The 2005 Plan was adopted by resolution of the District's Board of Directors on December 12, 2005 following a public hearing. The public hearing provided an additional opportunity, aside from the public workshop, for others to participate in the preparation of the Plan. After the Board of Directors' approval, the Plan was finalized and submitted to the California Department of Water Resources (DWR), the State Library, and Sacramento County within 30 days. Copies of the Notice of Public Hearing and the Resolution of Plan Adoption are included in Appendix D. Draft copies of the Plan were made available to the public within 30 days following the Board of Directors' approval.

Water Service Area

As required by the Act, the Plan must describe the service area of the District and provide information relevant to the current and projected population, climate, and other demographic factors affecting the water supplier's water management planning efforts.

Location

The District serves approximately 13,500 connections in the northeast portion of Sacramento County, California. Figure 1 illustrates the District's service area and their location relative to other water purveyors. The service area is approximately 6,160 acres and is entirely within the unincorporated area of Sacramento County. The service area is bounded by San Juan Avenue on the west, Madison and Pershing Avenues on the north, Walnut and Main Avenues on the east, and parts of Folsom Lake State Recreation Area and Sacramento County's American River Parkway on the south.


PLACER COUNTY WA
CAL-AM
ORANGEVALE
RIO LINDA WD
CITRUS HEIGHTS
SAN JUAN WD
FOLSOM LAKE
NATOMAS CENTRAL
Mc CLELLAN AFB
CITY OF FOLSOM
EID
SACRAMENTO SUBURBAN
CARMICHAEL WD
FAIR OAKS WATER DISTRICT
CITY OF SACRAMENTO
CAL-AM
FRUITRIDGE VISTA WC
ZONE 40
CAL-AM
CAL-AM
SACRAMENTO COUNTY WATER AGENCY
ARDEN-CORDOVA WS
ELK GROVE
FIGURE 1 - WATER PURVEYOR SERVICE AREA
RIVERS

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Climate Characteristics

The climate characteristics of the District include cool and humid winters and summers that are typically hot and dry. The Sacramento region's monthly mean temperatures range from 45 to 76 degrees Fahrenheit based on a reporting period from 1961 to 1990 (Western Regional Climate Center). The Folsom Dam climate station was selected to provide more recent and local average temperatures within the District rather than within the Sacramento region. Table 2 summarizes the average monthly temperature as reported from the Folsom Dam climate station for the period of 1971 to 2000.

Table 2 – Average Climate Characteristics

Month	Mean Precipitation (inches)[1]	Mean Temperature (Fahrenheit)[1]	Regional Average ETo (inches)[2]	Calculated Average ETo (inches)[2]
Jan	4.46	46.9	1.59	0.91
Feb	4.34	51.5	2.20	1.57
Mar	4.30	55.0	3.66	3.41
Apr	1.84	59.4	5.08	4.24
May	0.52	66.0	6.83	6.34
June	0.31	72.7	7.80	7.4
July	0.11	77.7	8.67	8.07
Aug	0.10	76.8	7.81	7.1
Sept	0.45	73.4	5.67	5.27
Oct	1.32	65.9	4.03	3.47
Nov	3.47	54.4	2.13	1.51
Dec	3.39	47.1	1.59	1.05
Annual	24.61	62.2	57.06	50.34

[1] Western Regional Climate Center (Folsom Dam climate station from 1970-2000)
[2] California Irrigation Management Information System (Fair Oaks station #131)
[3] ETo = Evapotranspiration

The Folsom Dam climate station also provides precipitation information. The rainy season begins in November and ends in March. Average monthly precipitation during the winter months is about 3 to 4 inches, but records show that the monthly precipitation has been as high as 12 inches and as low as 0 inches. Relative humidity in the region ranges from 29 percent to 90 percent. Low humidity usually occurs in the summer months, from May through September. As expected, water demands in the summer increase as the weather becomes hot and dry.

Another climate characteristic is evapotranspiration. Evapotranspiration is the loss of water to the atmosphere by the evaporation of water from the soil and plant surfaces as well as the transpiration from the plant itself. The California Irrigation Management Information System collects evapotranspiration data from a station located in Fair Oaks (station #131). The station has been in operation since 1997. The monthly average evapotranspiration data from this station are not available from the California Irrigation Management Information System because at the time of calculation, in 2000, the Fair Oaks station did not have five years of

records. However, regional data are available and is listed in Table 2. Using the individual monthly data available from April 1997 through September 2005, average monthly evapotranspiration values were calculated for this Plan and included in Table 2.

Demographics

The District's service area is primarily characterized by residential land use with some commercial and institutional connections. Approximately 95 percent of the land area is classified as residential use. The overall density of residential development within the District is relatively low with many of the lot sizes ranging from 1.0 to 1.5 acres. In the future, some of these large lots may choose to split into multiple lots, thus increasing the population of the District and creating the need for additional service connections.

The Fair Oaks Community, as identified by Sacramento County, is estimated to have a population of 28,808 residents.[3] The boundaries of the Fair Oaks Community Area are not the same as the District, and therefore, specific population data and projections were obtained from the Sacramento Area Council of Governments (SACOG). Based on the Traffic Analysis Zones defined by SACOG, the population of the District was estimated by determining which zones overlapped the District. Using parcel information, area factors were applied to each of the zones based on the portion of the District's area within that zone.

Because recent and proposed developments such as the Gum Ranch Development within the District are to be completed by 2010, the SACOG population projections were slightly modified to reflect this condition. The percentage for growth in the District was front loaded meaning a greater percentage was applied to the 2010 and 2015 projections while still ending at the SACOG proposed population in 2025. Table 3 presents the current and projected population for the District through 2030.

Table 3 – Fair Oaks Water District Population Projections

	2005	2010	2015	2020	2025	2030
Service Area Population	39,550	40,180	40,580	40,785	40,990	41,190

Source: SACOG Traffic Analysis Zones within the District's service area. Population projections were slightly modified by the District based on recent trends in the area. SACOG provided population projections through 2025 and therefore year 2030 is estimated by assuming a 0.5 percent growth between 2025 and 2030.

[3] Fair Oaks Community website: www.communities.saccounty.net/fair-oaks/

Section 2 – Water Sources and Supplies

This chapter describes the existing District's water system including water sources and supplies.

Water Sources

The District works together with two primary agencies to ensure a safe and high-quality water supply, which will continue to serve the community in periods of drought and shortage. The agencies who work with the District to provide these services are the San Juan Water District, a wholesale water agency, and the Sacramento Groundwater Authority.

San Juan Water District (SJWD)

SJWD was formed in 1954 and is a wholesaler and retailer of potable water. The wholesale area includes the service areas of the Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, and a portion of the City of Folsom and Sacramento Suburban Water District. The retail customer is SJWD.

Before SJWD was formed, water was supplied to the area by the North Fork Ditch Company (Company). The Company provided water for dredge mining along the American River and also sold water to Citrus Heights Irrigation District, Fair Oaks Irrigation District, and Orange Vale Water Company. Because many of the Company's facilities would be impacted with the construction of Folsom Dam, a committee was formed by residents of Citrus Heights Irrigation District, Fair Oaks Irrigation District, and Orange Vale Water Company to study the development of a publicly owned water supply system to continue supplying the area with wholesale water. The San Juan Suburban Water District (now SJWD) was formed by the acquisition of the Company including its pre-1914 water rights of 33,000 acre-feet from the American River.

Sacramento Groundwater Authority (SGA)

In 1998, the SGA was formed to manage the Sacramento region's North Area Groundwater Basin (Basin). SGA was established in part by the Sacramento Area Water Forum (Water Forum). The Water Forum is a diverse group of local water utilities, business and agricultural leaders, and representatives from the environmental community that reached consensus on preserving the lower American River while ensuring a reliable water supply through the year 2030 for the region. In 1999, the Water Forum members approved the Water Forum Agreement, which consists of a multitude of actions necessary to provide a regional solution to water shortages, environmental degradation along the American River, and groundwater contamination.[4]

[4] Water Forum, Central Sacramento County Groundwater Forum Early Review and Authorization to Proceed, March 2004.

The SGA is a joint power authority authorized by an agreement signed by the County of Sacramento and the Cities of Citrus Heights, Folsom, and Sacramento. SGA has 16 board members, of which the District is a member. The mission of SGA is to manage, protect and sustain the groundwater resources of the Basin consistent with the Water Forum Agreement for the benefit of the water users within the Basin and to coordinate with other water management entities and activities throughout the region.[5] In an effort to sustain the groundwater resources and coordinate with the 14 overlying water purveyors of the Basin, SGA prepared a Groundwater Management Plan. On December 11, 2003, SGA adopted the Groundwater Management Plan. In addition to being a member of SGA and agreeing to the conclusions of the Groundwater Management Plan, the District also decided to adopt this Groundwater Management Plan for groundwater operations within their service area. The Groundwater Management Plan is included in Appendix E.

Water Supply

The District currently receives approximately 95 percent of its water supply from treated surface water though SJWD supplied from the American River. Seven groundwater wells accessing the Basin supplement the surface water supply for emergency situations and to meet peak demands. Currently, groundwater meets the remaining 5 percent of the District's water demands. The percentages of surface water and groundwater used by the District may change in the near future due to the construction of two new wells. The District will determine the appropriate mix of surface water and groundwater to meet the needs of its customers.

The District also has five inter-ties with neighboring agencies for emergency purposes, however, the use of these inter-ties is limited due to their size and the availability of water. For example, two neighboring districts with inter-ties, Orange Vale Water Company and Citrus Heights Water District, also receive water from SJWD and if surface water is interrupted, these districts may have trouble supplying water to the District in an emergency situation.

Current and projected water supplies available to the District from surface water and groundwater are shown in Table 4 and described in subsequent sections. The historical water supplies from surface water and groundwater are shown in Table 5.

[5] SGA Website, http://www.sgah2o.org/sga/

Table 4 – Current and Projected Water Supplies
(acre-feet per year)

Water Supply Sources	2005	2010	2015	2020	2025	2030
SJWD – Surface Water Diversion	12,260	15,000	15,000	15,000	15,000	15,000
Groundwater Production	240	8,900	8,900	8,900	8,900	8,900
Total Water Supply	12,500	23,900	23,900	23,900	23,900	23,900

Notes: 1. Current water supplies are based on actual usage through October and projected through December.
2. Surface water supplies are equal to the District's agreement with SJWD.
3. Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service. The future well capacity includes the proposed Well #10 and Well #11 as shown in Table 7. In the future, an additional 2,000 gpm of remediated groundwater may become available to the District from Aerojet. Section 3 describes this future supply in more detail.
4. Projected water supplies are those supplies that are available to the District. The District has the operational flexibility to utilize surface water and groundwater in any combination to meet demands.

Table 5 – Historical Water Supplies

Year	Annual Production (acre-feet/year)		
	Surface Water	Groundwater	Total
1985	15,552	153	15,705
1986	17,014	6	17,020
1987	16,024	943	16,967
1988	16,220	1	16,221
1989	15,118	21	15,139
1990	15,152	35	15,187
1991	14,631	87	14,718
1992	14,577	97	14,674
1993	14,808	54	14,862
1994	15,759	225	15,984
1995	14,795	95	14,890
1996	13,766	310	14,076
1997	13,771	482	14,253
1998	11,924	591	12,515
1999	14,235	188	14,423
2000	14,018	439	14,457
2001	15,040	138	15,178
2002 [2]	11,456	1,791	13,247
2003	12,333	314	12,647
2004	13,629	286	13,915

[2] In 2002, the groundwater pumping increase was due to a regional agreement with the Environmental Water Account (EWA) where the District agreed to pumped groundwater in-lieu of using surface water.

Surface Water

As mentioned earlier, a significant portion of the District's water supply comes from surface water wholesaled by SJWD. SJWD diverts surface water from Folsom Reservoir. SJWD's surface water supply consists of the following:

1. Pre-1914 Water Rights: SJWD has two pre-1914 water rights with a combined maximum diversion rate of 75 cubic feet per second (cfs) up to a total of 33,000 acre-feet per year. The water rights are designated by the State Water Resources Control Board (SWRCB) as A005830 and S000656. Copies of the water rights are included in Appendix F.

2. Placer County Water Agency Contract: SJWD's contract provides 25,000 acre-feet per year from Placer County Water Agency. This contract extends through 2021 and places a first priority on use in Placer County, but allows any excess water to be used in Sacramento County.[6]

3. Central Valley Project (CVP) Water: SJWD has two contracts with the United States Bureau of Reclamation (USBR) for the diversion of 24,200 acre-feet of CVP water. The contracts include No. 14-06-200-152A-IR7 and No. 6-07-20-W1373.

The District and SJWD entered into a water supply contract on December 11, 1991. The 1991 Contract increased the minimum quantity of water delivered from 12,375 acre-feet to 15,000 acre-feet per annum, measured at meters operated and maintained by SJWD. On January 01, 2004 an "Interim" wholesale water supply contract was executed based on the intention that a final agreement would be developed in the near future that incorporates conjunctive use provisions. For the purposes of this Plan, the District's surface water supplies are assumed to be 15,000 acre-feet per year.

Water Supply Facilities

Surface water is treated at the Sydney N. Peterson Water Treatment Plant (WTP), which is owned and operated by SJWD. The capacity of the Peterson WTP is 120 million gallons per day (mgd). After being treated at the Peterson WTP, water is conveyed to the 62 million gallon, or 190 acre-feet, Hinkle Reservoir. Hinkle Reservoir provides water storage to meet fluctuations in demand and to provide emergency supply if the WTP is taken out of service. From the Hinkle Reservoir, water is distributed via pipelines to customers of SJWD. Two transmission pipelines provide treated surface water to the District.

The District currently maintains three metered connections to the SJWD's transmission main system. The characteristics of these connections are shown in Table 6. The 18-inch connection branches off of the 40-inch pipeline (Main Avenue Connection) to serve the eastern edge of the District.

[6] San Juan Water District, Urban Water Management Plan, 2005.

Table 6 – Surface Water Connections

Size	Connection	Capacity[1]
40-inch	Main Avenue @ Madison	25 mgd
12-inch	Main Avenue @ Twin Lakes	5 mgd
40-inch	Filbert Avenue @ Pershing	25 mgd
Total Capacity		**55 mgd**

[1] Connection capacities are estimated.

Distribution System

The District's distribution system includes transmission mains varying from 8 to 39 inches in diameter, a 3 million gallon reservoir and pump station, and nine pressure reducing stations. The distribution system contains over 180 miles of pipeline.

Three pressure zones compose the distribution system. The upper zone pressure is maintained by the 3 million gallon reservoir and pumping system. The hydraulic grade line of the middle pressure zone is maintained by the water level in Hinkle Reservoir, which is supplemented by water wells if low pressure occurs. Pressure in the lower (reduced pressure) zone is maintained by four pressure reducing stations on pipelines delivering water from the zone above. The pressure in the upper zone is maintained by the booster station, which takes suction from the 3.0 million gallon reservoir. The reservoir is filled from a 30-inch transmission main during low demand times.

Groundwater

In addition to surface water, the District pumps groundwater to meet its water demands. As mentioned earlier, the District has adopted a Groundwater Management Plan. The goal of the Groundwater Management Plan is to ensure a viable groundwater resource for beneficial uses while supporting the Water Forum Agreement. The Groundwater Management Plan establishes the management objectives and the primary components needed to meet this goal.[7] The components discussed in the Groundwater Management Plan include:

- Stakeholder Involvement
- Monitoring Program
- Groundwater Resource Protection
- Groundwater Replenishment
- Planning Integration

[7] SGA, Groundwater Management Plan, 2003

The information presented in the Groundwater Management Plan is summarized in the following sections, however more detailed information can be found in Appendix E.

Sacramento Region's North Area Groundwater Basin (Basin)

California has ten hydrologic regions as defined by DWR. The Sacramento River Hydraulic Region covers 27,200 square miles and stretches from the Sacramento-San Joaquin Delta to the Oregon border. The Sacramento River Hydraulic Region consists of 93 basins and subbasins.[8] Within the Sacramento Valley, the North American Subbasin covers a total area of approximately 548 square miles and is bordered by the Feather and Sacramento Rivers to the west, Bear River to the north, American River on the south, and on the east by the Sierra Nevada mountains.[9]

SGA manages the southern area of the North American Subbasin. The southern area has been designated by the Water Forum as the North Area Groundwater Basin (Basin). The Basin is bounded by the Sacramento River on the west, the American River on the south, Folsom Reservoir on the east and the northern Sacramento County line on the north. The groundwater resources of Sacramento County have been extensively studied and reported by DWR and others. The Groundwater Management Plan contains an overview and description of the groundwater basin. In summary, the water-bearing deposits underlying Sacramento County include an unconfined aquifer system consisting of the Victor, Fair Oaks, and Laguna Formations and a lower semi-confined aquifer system consisting of the Mehrten Formation.

The North American Subbasin is not adjudicated and based on the DWR' official departmental bulletins, California's Groundwater Bulletin 118 Update 2003 and Bulletin 160, The California Water Plan Update 2005, the North American Subbasin is not specifically identified as a basin in a critically overdraft condition. The Bulletin 118, February 2004 individual basin description for the North American Subbasin, does suggest that annual pumping exceeds the amount of water annually recharged, however, a detailed groundwater budget is not provided. SGA does not classify the Basin as overdrafted; however, it recognizes that groundwater levels fluctuate overtime and that historic groundwater extractions have resulted in a net depletion of groundwater stored in the Basin.

In an effort to protect the groundwater resources of the Basin, the estimated average annual sustainable yield recommendation for the Basin is 131,000 acre-feet as established by the Water Forum. Although there are areas within the Basin that are experiencing decreased groundwater levels, the pumping extractions have not exceeded the safe yield. The Basin is not in an overdraft condition; however, SGA is implementing programs to sustain the viability of groundwater resources. These programs are discussed in Section 4.

Groundwater Level Trends

The Groundwater Management Plan also discusses groundwater level trends. The Basin is broken down into four specific areas and the groundwater levels are summarized below:

[8] DWR, California's Groundwater Bulletin 118, 2003.
[9] DWR, California's Groundwater Bulletin 118, 2003.

- Western Area – Groundwater levels vary between -5 and 20 feet below mean sea level. Long-term trends of increased or decreased levels are not evident in this area.
- North-Central Area – Groundwater levels steeply declined from the 1950's to 1990. After 1990, groundwater levels stabilized. The stabilized level is approximately 40 feet below mean sea level.
- South-Central Area – The groundwater level trend in this area is moderately declining. The groundwater levels have declined approximately 20 feet between 1968 and 2002.[10] Within the North-Central and South-Central Area a regional cone of depression is evident. The cone of depression is a result of increased pumping within the Basin in excess of recharge capabilities.
- Eastern Area – The general trend for groundwater levels is stable near the American River and foothills, but declining away from the river and foothills. The District is within the Eastern Area.

SGA continually monitors groundwater level trends and has compiled groundwater-related data from water purveyors and DWR for inclusion in a data storage and accounting tool, the Data Management System. The Data Management System is a critical tool in SGA's monitoring program. The program includes the monitoring of groundwater elevations, monitoring of groundwater quality, monitoring and assessing the potential for land surface subsidence resulting from groundwater extraction, and developing a better understanding of the relationship between surface water and groundwater along the Sacramento and American Rivers.[11]

Recharge Facilities

The Basin is recharged by natural sources. Natural recharge occurs when groundwater producers use surface water in-lieu of pumping groundwater. The Basin generally operates as a reservoir in which the net amount of water stored is increased in wet years allowing groundwater levels to rise. The reduction in groundwater pumping naturally recharges the Basin. Other natural sources of recharge for the Basin consist of percolation from surface water, precipitation, and infiltration from streams. The Basin is mainly recharged by areas along the American and Sacramento Rivers where extensive sand and gravel deposits are present.

Fair Oaks Water District Groundwater Production Wells

Within the District, groundwater is produced from seven operating wells that vary in design capacity from 700 gallons per minute (gpm) to 1,500 gpm, with an existing total system design capacity of approximately 8,100 gpm as shown in Table 7. The wells are located primarily in the central portion of the District's water system and are used to meet short-term

[10] SGA, State of the Basin Report-2002, February 2004.
[11] SGA, Groundwater Management Plan, 2003.

supply or pressure needs. The District is constructing two additional wells, Well #10 and Well #11, to replace the existing Town Well and Heather Well. The well projects are anticipated to be complete in 2006. The well projects are discussed further in Section 4.

Table 7 – Fair Oaks Water District Active and Planned Wells

Well No.	Well Name	Design Capacity (gpm)
1	Town	1,200
4	Chicago	900
5	Heather	1,500
6	New York	1,300
7	Casa Bella	700
8	Fair Oak Park	1,000
9	Northridge	1,500
10	Proposed Town Well	2,000
11	Proposed Heather Well	1,500
Total Existing Capacity (2005)[1]		**8,100**
Total Proposed Capacity[2,3]		**8,900**

[1] The total existing capacity is calculated by summing the design capacities of existing Wells #1 through #9.

[2] The total proposed capacity is calculated by removing Well #1 and Well #5 from the total existing capacity and adding the proposed design capacities of Well #10 and Well #11.

[3] In the future, an additional 2,000 gpm of remediated groundwater may become available to the District from Aerojet. Section 3 describes this future supply in more detail.

Table 8 summarizes the amount of groundwater pumped by the District for the last five years.

Table 8 – Historic Groundwater Production
(acre-feet per year)

Well No.	2000	2001	2002 [1]	2003	2004
1	175.99	86.89	433.92	204.89	188.52
4	2.14	1.85	184.82	0.22	0.00
5	88.97	14.08	512.41	102.61	96.91
6	0.09	0.04	232.20	0.07	0.00
7	114.29	5.28	39.33	5.78	0.22
8	5.55	23.23	388.13	0.53	0.00
9	52.41	6.45	0.00	0.00	0.00
Total	**439.44**	**137.82**	**1,790.81**	**314.1**	**285.65**
% of Total Water Supply [2]	**3.0%**	**0.9%**	**13.5%**	**2.5%**	**2.1%**

[1] In 2002, the groundwater pumping increase was due to a regional agreement with the EWA where the District agreed to pumped groundwater in-lieu of using surface water.

[2] The total water supply for each year is listed in Table 5.

With the future completion of Well #10 and Well #11, the District will have enhanced its groundwater production capabilities. The District will continue to maximize its surface water supplies under its agreement with SJWD. At this time, the District does not anticipate pumping groundwater in the future to meet its demands unless agreements with other San Juan Family members are made for the District to utilize groundwater supplies in-lieu of their surface water supplies. Current and projected groundwater production from the Basin is shown in Table 9.

Although the District does not anticipate the need to pump groundwater to meet its demand, the San Juan Family depends on groundwater during drier years when there are not adequate surface water supplies. The groundwater capacity, although not used each year, must be available to meet the San Juan Family demands when surface water supplies are depleted. Table 9 lists the groundwater capacity that is needed to meet the demands of the San Juan Family during a single-dry year or multiple-dry years. With groundwater production capabilities, the District may enter into an agreement with SJWD to use groundwater supplies in-lieu of purchasing surface water to assist the San Juan Family meet its groundwater demands shown in Table 9. At this time, there are no agreements in place.

Table 9 – Current and Projected Groundwater Production
(acre-feet per year)

	2005[1]	2010	2015	2020	2025	2030
Fair Oaks Water District Demand [2,3]	240	0	0	0	0	0
San Juan Family Demand [4]	7,966	10,247	11,990	12,893	13,528	13,560

[1] Current water supplies are based on actual usage through October and projected through December.

[2] Although the District does not need to pump groundwater to meet its demands, the District may enter into an agreement with SJWD to use groundwater supplies in-lieu of purchasing surface water to assist the San Juan Family meet its water demands.

[3] In the future, 2,000 gpm of remediated groundwater may be available from Aerojet's proposed extraction and treatment facility. Additional information is provided in Section 3.

[4] San Juan Family groundwater projections are included in SJWD's 2005 Urban Water Management Plan (Table 7-2). The San Juan Family demand for 2025 and 2030 were calculated based on information provided from SJWD. The San Juan Family groundwater supplies are equivalent to the shortfall in surface water supplies to meet the San Juan Family demands as shown in rows "L" and "M" of Table 14. SJWD's 2005 Urban Water Management Plan anticipates the District will meet up to 70 percent of the San Juan Family's groundwater demand, however no agreement is in place. (See Note [2]).

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Section 3 – Water Quality

This section discusses the water quality of the surface water and groundwater sources used by the District. Management strategies that may be affected by water quality are also discussed.

Water Quality of Existing Sources

As required by the Safe Drinking Water Act, which was reauthorized in 1996, the District provides annual Water Quality Reports to its customers; also known as Consumer Confidence Reports (CCR). This mandate is governed by the United States Environmental Protection Agency (USEPA) and the California Department of Health Services (DHS) to inform customers of their drinking water quality. Please see Appendix G for the District's 2004 CCR. In accordance with the Safe Drinking Water Act, the District monitors regulated and unregulated compounds in its water supply and in years past, the water delivered to the District meets the standards required by the state and federal regulatory agencies.[12]

Surface Water Quality

The District receives treated surface water from SJWD. SJWD diverts American River water stored behind Folsom Dam and treats it with conventional filtration and chlorine disinfection at the Sydney N. Peterson WTP located west of Folsom Dam. SJWD tests its water for over 200 contaminants on a daily, weekly, monthly, and/or annual basis. SJWD is responsible for delivering water that meets state and federal standards to the District.

In 2001, SJWD completed a Source Water Assessment to evaluate the vulnerability of water sources to contamination. Water from the American River (Folsom Lake) is considered to be most vulnerable to contamination from the Folsom Lake State Recreation Area facilities, high-density housing and associated activities such as sewer and septic systems and fertilizer, pesticide and herbicide application, as well as illegal activities and dumping.[13]

American River

Water stored in Folsom Reservoir has numerous beneficial uses as defined by the Central Valley Regional Water Quality Control Board (RWQCB) including: municipal, domestic, and industrial water supply; irrigation; power; water contact and non-contact recreation; warm and cold freshwater habitat; warm freshwater spawning habitat; and wildlife habitat. The surface water obtained from the American River is generally of good quality and is acceptable for the beneficial uses listed above. The water is low in alkalinity, turbidity, disinfection byproducts, minerals, organic contamination, and Giardia and Cryptosporidium contamination.[14]

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[12] San Juan Water District (Fair Oaks Water District), 2004 Consumer Confidence Report.
[13] San Juan Water District (Fair Oaks Water District), 2004 Consumer Confidence Report.
[14] SGA, Groundwater Management Plan, 2003.

Surface Water Quality Programs

Water stored behind Folsom Dam is released to the Lower American River and travels for 27 miles to the confluence with the Sacramento River and then travels south to the Sacramento-San Joaquin Delta (Delta). The water quality of the American River is significant to the region. Regionally, water quality issues that are associated with water supplies stored in Folsom Reservoir include mercury and temperature. Although not necessarily a water quality parameter, minimum flows in the Lower American River impact fish habitat as well as impact Delta water quality objectives and demands.

Mercury

Under the federal Clean Water Act, states are required to develop a list of water quality limited segments. The Lower American River is on the State's list of impaired waterbodies due to mercury from historic mining operations.[15] In September 2004, the Office of Environmental Health Hazard Assessment (OEHHA) issued a health advisory for fish from Lake Natoma and the Lower American River due to increased levels of mercury in fish. Currently, mercury has not been detected in the District's water supply.

Temperature

Temperature is a critical water quality parameter to the survival of fishery habitat along the Lower American River. This requires diligent management of the cold water pool in Folsom Reservoir. Because of the close proximity of Folsom Reservoir to the Delta, releases from Folsom Reservoir are commonly relied on to help meet standards of the Bay-Delta Water Quality Plan. As a result, water releases to meet one objective (Delta standards) may make it more difficult to reach another objective (conserving the Folsom Reservoir coldwater pool). For this reason, temperature and flow releases are typically evaluated simultaneously for their impact/benefit to the environment.

An organization started by USBR to evaluate flows and temperature on the American River is called the American River Operations Work Group (AROG). The AROG was started in 1996 and includes representatives from various federal, state, local, and private sector agencies and environmental recreation organizations. The AROG evaluates data supplied by USBR on the conditions of the river and discusses how to manage both water flows and water temperatures to protect the fish. AROG's water management recommendations to USBR are advisory; however USBR does manage their releases from Folsom Reservoir according to the recommendations when feasible.

Flow Regimes

USBR is mandated to meet water quality and minimum flow requirements set by the Central Valley Project Improvement Act (CVPIA), the San Francisco Bay-San Joaquin Delta Water Quality Plan, the SWRCB, and others. The existing criteria for flow standards are not sufficient to protect the beneficial uses of the Lower American River. The Water Forum recently completed the Lower American River Flow Management Standard Policy. This

[15] Water Forum, Lower American River State of the River Report, April 2005.

policy, recently accepted by USBR, will change the operations at Folsom Reservoir to improve fish flow releases while meeting the requirements of the Water Forum Agreement and CVPIA provisions.[16] The Flow Management Standards (FMS) are further discussed in Section 4.

Groundwater Quality

SGA manages the Basin and conducts a comprehensive water quality monitoring program. SGA collects data from over 260 wells for inclusion in the Data Management System. The Data Management System includes groundwater quality data from 1991 through the present. The groundwater quality issues facing the Basin are addressed in the Groundwater Management Plan and are summarized below for the region.

Nitrates

The maximum contaminant level (MCL) in California according to Title 22 standards for Nitrate as NO_3 is 45 milligrams per liter (mg/L). Basin levels vary from non-detect to 28 mg/L within the groundwater wells sampled.

Total Dissolved Solids (TDS)

Another water quality concern is total dissolved solids (TDS). The lower aquifers have higher concentrations of TDS. Once below 1,200 feet, the TDS concentration exceeds 2,000 mg/L and requires treatment to meet potable demands.[17] Within the Basin, levels for TDS have a range of 34 to 657 mg/L, although most wells in the SGA area sampled between 140 mg/L and 320 mg/L.[18] These values meet the secondary standard for TDS at 500 mg/L.

Iron and Manganese

Levels of iron and manganese in the Basin can vary within a considerable range. The secondary MCL for iron and manganese are 0.3 mg/L and 0.05 mg/L, respectively. Based on the results from the Data Management System, concentrations for iron vary from non-detect to 16,000 micrograms per liter (µg/L) and from 2µg/L to 1,700 µg/L for manganese. The average level for wells in the Basin is approximately 200 µg/L for iron and 50 µg/L for manganese.

Arsenic and Chromium

The primary federal MCL for Arsenic is 10 µg/L. Currently, the California MCL is 50 µg/L; however, on January 23, 2006 California standards will be required to comply with the federal MCL. Wells within the Basin have results from 1 to 22 µg/L, with an average value of 5 µg/L for arsenic.

[16] Water Forum, Lower American River State of the River Report, April 2005.
[17] SGA, Groundwater Management Plan, 2003.
[18] SGA, Groundwater Management Plan, 2003.

Chromium has a MCL of 50 µg/L. Results from monitoring within the Basin indicate concentrations range from non-detect, less than 1 µg/L, to 52 µg/L. The average value of Chromium in the groundwater wells sampled is between 8 to 12 µg/L.

Radon-222

According to the District's CCR, Radon-222 levels range from 123 to 885 picocuries per liter (pCi/L). There is no standard MCL for Radon and it is currently an unregulated drinking water constituent. The USEPA, however, has started the process to implement a regulated MCL of 300 pCi/L for a community water system not having a Multimedia Mitigation Plan and 4,000 pCi/L for those with a plan.[19] Radon occurs naturally in soils due to the breakdown of uranium. Radon is a carcinogen if inhaled or ingested.

Plumes

The Data Management System includes data on groundwater contaminant plumes in the region. The identified plumes within the Basin are from the former McClellan Air Force Base (AFB) and the Aerojet property. The McClellan AFB plume is down gradient from the District's wells and is not expected to impact groundwater quality for the District.[20] The plumes are discussed below:

McClellan Air Force Base (AFB) Plume

Between 1936 and 2001, the McClellan AFB used various chemicals in many of its operations including fuels for power and solvents for cleaning equipment. Over the years, these operations led to the contamination of the soil and groundwater beneath the McClellan AFB. It is estimated that the groundwater is contaminated to a depth of about 400 feet below the ground surface. The contaminants of concern from the McClellan AFB include trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene (DCE), and 1,2-dichloroethane (DCA). The clean-up program at McClellan AFB includes 57 extraction wells, a centralized treatment system, and over 500 monitoring wells. The system treats approximately 1,200 gpm with an expansion to 2,000 gpm proposed in 2005. The treated groundwater is then discharged to Magpie Creek which drains to the Sacramento River.[21]

A recent proposal for the groundwater remediation program at the McClellan AFB reduced the scope of remediation and instead recommends a containment strategy. SGA submitted a letter in response to this strategy dated August 16, 2005 to the United States Air Force, Department of Toxic Substances Control (DTSC), and the USEPA. It is SGA's position that the Air Force be held accountable for full clean-up and remediation of contamination at the McClellan AFB since other containment programs in the area have proven unsuccessful.[22] On September 16, 2005, a joint press release from the United States Air Force, USEPA,

[19] USEPA's website: http://www.epa.gov/safewater/radon/proposal.html
[20] Brown and Caldwell, Fair Oaks Water District Bureau of Reclamation Five-Year Water Management Plan Update, October 2004.
[21] Air Force Real Property Agency, McClellan Fact Sheet Groundwater, March 2005.
[22] SGA letter to US Air Force, DTSC, and USEPA dated August 16, 2005.

DTSC, and RWQCB stated that the decision to scale down remediation would be deferred until additional information was obtained on groundwater conditions, effective remediation alternatives, and standards for considering the clean-up complete. Although final remediation levels have not been decided, the United States Air Force, on October 28, 2005, declared that the groundwater contamination is completely contained.[23]

Aerojet Plume

In 2003, groundwater contamination was discovered north of the American River. The extent of the Aerojet plume north of the river is at the southern edge of the City of Carmichael.[24] The extent of the contamination, movement rate, and direction are not completely defined although water districts are actively working with Aerojet to determine the characteristics of the plume. The potential extent of contamination in the Basin may adversely affect the usable yield of groundwater.[25] If this occurs, those districts that agreed per the Water Forum Agreement to use groundwater in-lieu of surface water in dry years may not be able to do so if the groundwater is contaminated. If the Basin is contaminated, increased diversions from the American River will need to occur which is inconsistent to the Water Forum Agreement.

In response to the groundwater contamination, SGA formed a Groundwater Contamination Committee. The District is a member of this committee. The committee's goal is to 1) raise the level of awareness of the growing groundwater contamination to regulatory agencies, 2) insist that the responsible parties fully delineate and contain all contaminant plumes, 3) ensure that the responsible parties expeditiously proceed with clean-up efforts, and 4) have the responsible parties develop a plan for alternative water supplies in advance of contamination being detected in public water supply wells.[26]

The Groundwater Contamination Committee meets monthly with regulators, water purveyors, and responsible parties regarding the Aerojet plume. Aerojet is working on a planning document for replacement water supply for the Carmichael Water District and the District.[27] The contaminant of concern for the District is TCE, however, other contaminants such as n-nitrosodimethylamine (NDMA) and perchlorate may also threaten the District in the future. Both contaminants have been discovered in groundwater supplies north and south of the American River and originate from the Aerojet property.

Groundwater Quality Programs

Similar to SJWD, the District prepared an assessment of the District's drinking water in 2002 from groundwater wells. The groundwater sources were found to be most vulnerable to possible contamination from commercial urban activities such as active and historic gas

[23] Sacramento Bee by Chris Bowman, McClellan Clean-up; Air Force Salutes Clean-up Milestone; Polluted Groundwater at McClellan is Declared Contained, but Regulators Need the Data Confirmed, October 28, 2005.
[24] Water Forum, Lower American Report State of the River Report, April 2005.
[25] Water Forum, Lower American Report State of the River Report, April 2005.
[26] Carmichael Water District, Water Ways Issue No. 3, Fall 2004.
[27] SGA board meeting on June 9, 2005, final minutes.

stations, dry cleaners, leaking underground storage tanks, and sewer collection systems.[28] The District continues to monitor its groundwater wells for the first indication of problems as part of their water management strategy.

SGA supports and is involved in addressing water quality concerns of the Basin. Some of the programs and activities include:

- Groundwater Quality Monitoring – The Groundwater Management Plan recommends the construction of shallow monitoring wells to warn of water quality issues prior to contaminants reaching supply wells. Many of the monitoring wells surrounding the McClellan AFB and the Aerojet property will be included in the monitoring program and the Data Management System.
- Groundwater Resource Protection – The first line of defense for groundwater resource protection is the prevention of contamination. Prevention measures include proper well construction and destruction practices, development of wellhead protection measures, and protection of recharge areas. One protection measure is the establishment of the consultation zone. If a well's location is proposed within 2,000 feet (consultation zone) of a known contaminant plume, Sacramento County Environmental Management Department requires a special review of the permit by appropriate regulatory agencies.

Water Quality Effect on Water Management Strategies and Supply Reliability

Section 3 summarized the general water quality issues facing the District's surface water and groundwater supplies. The District has not experienced any significant water quality problems in the past. In the near future, USEPA's Stage 2 Disinfection Byproducts Rule will be implemented. Stage 1 was implemented in 2002 and lowered the MCL for total trihalomethanes (THM) within the distribution system; Stage 2 will require each location in the distribution system to meet the MCL. The District's water supplies meet the requirements of Stage 1 and will be required to meet Stage 2 levels when they become finalized.

Although the District has not had water quality problems in the past, groundwater contamination is a specific water quality threat that may impact the District's planning and operational strategies for a safe and reliable water supply in the future. The District's plan is to mitigate for potential problems prior to any loss in supply. Currently and in the future, the District does not anticipate any reduction in supply due to water quality issues. The following sections describe water management strategies being implemented by the District in response to the threat of groundwater contamination.

[28] San Juan Water District (Fair Oaks Water District), 2004 Consumer Confidence Report.

Aerojet Plume

On March 16, 2005, the District conducted a joint Town Hall Meeting with Carmichael Water District to educate their customers on the growing concerns related to groundwater contamination from the Aerojet property. The District's water management strategy related to the threat of groundwater contamination includes collaboratively working with Aerojet and regulatory agencies to install groundwater extraction and treatment facilities to treat and contain the TCE plume. The District will also continue its involvement on the Groundwater Contamination Committee, through the SGA, to increase the awareness of groundwater contamination and the effects it would have on future drinking water supplies.

The District has the right to beneficially use groundwater to meet its customers' need for drinking water. Even if none of the District's wells are contaminated, Aerojet's extraction facilities may hinder the District's right to develop their groundwater resources in the future. Per the Water Forum Agreement, the San Juan Family is committed to increasing its use of groundwater during drier years and therefore protection of the Basin is essential. Protection of the Basin must involve both the removal of contaminants and in-basin disposal alternatives for the treated groundwater to minimize the depletion of the Basin by excessive pumping for remediation purposes.

Aerojet's current remediation plan for the District includes continued water quality monitoring and the installation of two groundwater extraction wells, pipelines, and treatment facilities to halt the progression of the TCE plume. The facilities will be constructed, owned and operated by Aerojet. The wells will be online within the next five years and are anticipated to have a combined treatment capacity of 2,000 gpm.

The District maintains the position that any water extracted from the Basin, within the community of Fair Oaks, by Aerojet is subject to the prior water rights of the District. The District's seven water supply wells draw groundwater from aquifers where contamination is present and from which Aerojet proposes to expand its groundwater extraction system. This groundwater must remain within the Basin and any water that leaves the Basin must be replaced, to the District, gallon for gallon by another source of supply.

Methyl Tertiary-Butyl Ether (MTBE)

Although MTBE has not been detected in any of the District's wells, there are a number of identified sites with leaky underground storage tanks (LUST) throughout the District's service area. Within the Basin, approximately 190 active LUST sites have been identified. In response to the MTBE contamination, the District filed a lawsuit in 2003 against nine oil and petroleum-related companies in conjunction with nine other litigants. The suit seeks funding from the responsible parties to pay for the investigation, monitoring, and removal of oxygenates from the Basin.

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Section 4 – Water Reliability Planning

This section provides information regarding the reliability of the District's water supply. The availability of surface water and groundwater sources is discussed in conjunction with constraints and limitations.

Reliability of Water Supplies

Reliability is a measure of a water service system's expected success in managing water shortages. The combination of demand management and supply augmentation options help to reduce the frequency and severity of shortages. The reliability of the District's water supply is dependent on the reliability of both surface water supplies and groundwater supplies. Surface water supplies are managed and delivered by SJWD, while the groundwater supplies are managed by SGA. The following sections will discuss these agencies as well as others, their roles in water supply reliability, and the near and long-term efforts they are involved with to ensure future reliability of water supplies to the District and the region as a whole.

Regional Agencies and Water Reliability

Regional Water Authority (RWA)

The Regional Water Authority (RWA) is a joint powers authority that was formed in 2001 that represents the interests of 21 water purveyors in Sacramento, Placer, and El Dorado Counties including the District. The organization's primary mission is to help its members protect and enhance the reliability, availability, affordability, and quality of the region's water resources.[29]

RWA has launched significant programs on a regional scale including:

- A water efficiency program designed to help local purveyors implement best management practices (BMPs) on a regional basis.
- Implementation of the American River Basin Conjunctive Use Program (ARBCUP). The ARBCUP includes 12 project components, which when complete, will assist the region in better managing its surface and groundwater resources. In 2002, RWA was awarded a $22 million grant through DWR to fund 50 percent of the implementation costs for the ARBCUP. The ARBCUP is expected to increase the region's water supplies by more than 20,000 acre-feet.
- Developing and implementing an Integrated Regional Water Management Plan (IRWMP). The IRWMP will include a number of programs and projects to improve the region's water supply reliability including conjunctive use, water recycling, and water use efficiency. The IRWMP will be prepared in cooperation with the United States Army Corps of Engineers.

[29] RWA website, www.rwah20.org

Sacramento Groundwater Authority (SGA)

In conjunction with RWA, SGA is committed to expanding conjunctive use opportunities within the region. Conjunctive use is the coordinated management of surface water and groundwater supplies. Conjunctive use increases total available water supplies, enhances water supply reliability, and provides the opportunity for enhanced environmental uses of water. Because most of the region is developed, there are limited opportunities for direct recharge of the Basin. As a result, the Basin is recharged through conjunctive use programs by utilizing surface water when available to allow the Basin to naturally recharge (decrease in pumping). Conjunctive use also benefits the environment by providing additional surface water when needed. For example, in dry years, conjunctive use could provide additional cold water from Folsom Reservoir to support fisheries in the Lower American River.

A number of the proposed SGA and RWA regional projects were a result of the Cooperating Agencies Regional Water Management Plan (RWMP). The RWMP identified, described, evaluated, and recommended project and program alternatives for implementing the Water Forum Agreement north of the America River.[30] Some of the resulting projects included:

- SGA – Sacramento Area Flood Control Agency (SAFCA) Pilot Study, 2002 – In 1999/2000 a pilot test was conducted to investigate the feasibility of a large-scale conjunctive use program. SAFCA diverted and stored 2,100 acre-feet of surface water in the Basin. The following year, 1,995 acre-feet of groundwater was pumped in lieu of diverting CVP water from Folsom Reservoir.
- CALFED Bay-Delta Program (CALFED) EWA Pilot Study – In 2002, the SGA entered into an agreement with EWA for the sale of surface water. The exchange was for 7,143 acre-feet. Local demands were met with groundwater.
- Sac Suburban's Groundwater Stabilization Project – This project provided up to 29,000 acre-feet of surface water per year to an area within Sacramento Suburban Water District's service area that relied on groundwater. From 1998 to 2001, Sacramento Suburban Water District reduced its groundwater use and noticed groundwater levels begin to stabilize.

Water Forum

The Water Forum is a group of leaders from the community including water professionals that determine actions to implement for protecting the region from water shortages, environmental degradation, groundwater contamination, and threats to groundwater reliability.[31] There are two main objectives of the Water Forum:

1. Provide a reliable and safe water supply for the region's economic health and planned development to the year 2030.

[30] SGA, Groundwater Management Plan, 2003.
[31] San Juan Water District Urban Water Management Plan Update 2000.

2. Preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River.

The members of the Water Forum signed an agreement known as the Water Forum Agreement consisting of seven actions necessary to accomplish the above objectives. The seven major elements to the Water Forum Agreement include:[32]

1. Increased surface water diversions
2. Actions to meet customers' needs while reducing diversion impacts in drier years
3. Improved pattern of fishery flow releases from the Folsom Reservoir
4. Lower American River habitat management element
5. Water conservation
6. Groundwater management
7. Water Forum successor effort

The intent of the Water Forum Agreement is to increase the use of groundwater in dry years and reduce surface water diversions. The decrease in dry year diversions will provide instream flows in the Lower American River for environmental purposes. In wet years, diversions will be increased to allow the Basin to recharge. The District is signatory to the Water Forum Agreement as a member of the San Juan Consortium (Family). The consortium includes the SJWD, and its wholesale customers: the District, the Orange Vale Water Company, the Citrus Heights Water District, and the City of Folsom. Under the San Juan Consortium, the District will participate in each of the seven complementary actions of the Water Forum Agreement.

Lower American River Flow Management Standard

In September 2005, the Water Forum, USBR, and the United States Fish and Wildlife Service reached an agreement on a flow regime for the Lower American River. The objective of the new flow management standards (FMS) is to maintain the temperature and quantity of flows in the Lower American River at acceptable levels for fish protection. The agreed upon FMS includes the development of a river management group, a monitoring program, and agreements with American River purveyors to make additional water available to the system in dry and critically dry years.[33] The new FMS calls for a minimum flow in the Lower American River between 800 – 2,000 cfs depending on the hydrologic conditions, time of year, and year type.

San Juan Water District (SJWD)

SJWD's primary goal is to provide reliable and safe water supplies to meet the water needs of its wholesale and retail service area at reasonable costs. The reliability of SJWD's water supply is threatened by USBR cutbacks on CVP supplies and on a smaller scale by emergency situations that may interrupt water deliveries. In response to these challenges,

[32] Water Forum, Water Forum Report January 2002 through June 2004.
[33] USBR, News Release on Lower American River Gets New Flow Regime, September 13, 2005.

SJWD continues to develop and encourage projects and programs to ensure reliability now and into the future.

Central Valley Project (CVP) Reliability

Although SJWD has contracts with USBR for the delivery of CVP water, the contracted amount is not guaranteed each year. The amount of water available to the CVP contractors is based on the hydrologic conditions and operational flexibility opportunities within the CVP supplies.[34] Each year USBR announces the water supply allocation for CVP water supplies. For example, SJWD's two USBR contracts are subject to 25 percent reductions during drought periods.

In January 2005, USBR announced the initial allocations for the year. Two forecasts were prepared; one for a dry condition which is 90 percent exceedence, and above normal conditions which is 50 percent exceedence. Table 10 lists the percentages of the initial supply forecast based on a January 1, 2005 water supply outlook. As conditions change through the year, USBR issues revisions to the initial allocations. In 2005, USBR released changes on April 15th, April 28th, May 18th, and July 25th as a result of increased wet conditions and lower than normal demands in Northern California. The final allocation for the CVP contractors is shown in Table 11. Because SJWD is a "north of the Delta" contractor, SJWD was able to divert up to 100 percent of its CVP contracted amount in 2005.

Table 10 – Initial Water Year 2005 Supply Forecast January 2005

Mid-Pacific Region									
Probability of Exceedence Forecasts	Percent of Historical Average Sacramento Valley Index & Year Type	North of Delta Allocation (%)				South of Delta Allocation (%)			
		Ag	M&I	R	WR	Ag	M&I	R	WR
50%	93% Above Normal	100	100	100	100	60	85	100	100
90%	72% Dry	60	85	100	100	60	85	100	100
Recent Historic Average (5-Year Average Allocation)		92	97	100	100	66	91	100	100

Source: USBR Central Valley Operation Website, http://www.usbr.gov/mp/cvo/
Abbreviations: Ag = Agriculture; M&I = Municipal and Industrial; R = Wildlife Refuge, WR = Water Rights

Table 11 – Update Water Year 2005 Supply Forecast July 2005

Mid-Pacific Region									
Probability of Exceedence Forecasts	Percent of Historical Average Sacramento Valley Index & Year Type	North of Delta Allocation (%)				South of Delta Allocation (%)			
		Ag	M&I	R	WR	Ag	M&I	R	WR
90%	84% Below Normal	100	100	100	100	90	100	100	100
Recent Historic Average (5-Year Average Allocation)		92	97	100	100	66	91	100	100

Source: USBR Central Valley Operation Website, http://www.usbr.gov/mp/cvo/
Abbreviations: Ag = Agriculture; M&I = Municipal and Industrial; R = Wildlife Refuge, WR = Water Rights

[34] USBR Letter Announcing Initial Water Supply Outlook for Water Year 2005, January 21, 2005.

Central Valley Project (CVP) – Operations Criteria and Plan (OCAP)

USBR revised their Long Term Operations Criteria and Plan (OCAP) for the CVP in 2004. SJWD receives water from the American River Division of the CVP, which includes facilities of Folsom and Auburn South Units, Folsom Dam and power plant, as well as Nimbus Dam, Lake Natoma, Folsom South Canal, and the Nimbus Power Plant.[35] The purpose of the OCAP is to serve as a baseline description of the facilities and operating environment of the CVP. The OCAP identifies factors influencing the decision-making process such as physical and institutional conditions under which the projects currently operate. In addition, the OCAP describes future operations with certain new facilities and operating criteria in place. Regulatory and legal requirements are explained as well as alternative operating models and strategies.[36] SJWD meets with USBR periodically to discuss how any operational changes for Folsom Reservoir will affect the delivery of CVP water.

Regional Water Quality Control Board – Central Valley Region

The SWRCB and the nine Regional Water Quality Control Boards (Regional Boards) are responsible for the protection and, where possible, the enhancement of the quality of California's waters. The SWRCB sets statewide policy, and together with Regional Boards, implements state and federal laws and regulations. Each of the nine Regional Boards adopts a Water Quality Control Plan (Basin Plan), which recognizes and reflects regional differences in existing water quality, the beneficial uses of the region's ground and surface waters, and local water quality conditions and problems.

The District is located within the Central Valley Region, Region 5. The original Basin Plan for Region 5 was adopted in 1975; however, the current Basin Plan is on its fourth edition and was adopted in 1998. The Basin Plan for the Central Valley Region covers the area within the Sacramento and San Joaquin River drainage basins.[37]

The Basin Plan establishes water quality standards for all the ground and surface waters of the region. Water quality concerns in the region are also listed in the Basin Plan, along with their causes, if known. For water bodies where the water quality is below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. Surface water quality degradation within the Central Valley Region is mainly due to point and non-point discharges. The constituents of concern within the American River, mercury, TDS, and temperature, were discussed in Section 3 of this Plan.

The RWQCB also regulates water discharges to minimize and control their effects on the quality of the region's ground and surface waters. Permits are issued under a number of programs and authorities. The legal basis and authority for the RWQCB reflects,

[35] Long-Term Central Valley Project Operations and Criteria and Plan, US Department of the Interior Bureau of Reclamation Mid-Pacific Region, June 2004.

[36] US Department of the Interior, Bureau of Reclamations website, News Release November 2003 http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=669

[37] Central Valley Regional Water Quality Control Board, Region 5, Water Quality Control Plan (Sacramento and San Joaquin River Basin), September 1998.

incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code (Porter-Cologne Water Quality Control Act) and the Clean Water Act.

Vulnerability of Supply to Seasonal or Climatic Shortage

It's likely that the District's surface water supplies are vulnerable to water shortages due to the climatic environment and changes in unimpaired flow to Folsom Reservoir. The groundwater supplies, however, are not as vulnerable and will be used when surface water supplies are decreased. Therefore, the District's overall water supplies are not greatly impacted by changes in climate. While the data in Table 16 through Table 22 identify water availability during normal, single-dry, and multiple-dry years, response to a future drought would follow the implementation of the appropriate stage of the District's Water Conservation Requirements and Enforcement Measures as discussed in Section 7.

Limitations on the amount of water that can be diverted from the American River have been defined by the Water Forum Agreement based on unimpaired flows to Folsom Reservoir. The Water Forum Agreement as it applies to the San Juan Consortium stipulates that:[38]

- Most Years are defined as years when the projected March through November unimpaired inflow to Folsom Reservoir is greater than 950,000 acre-feet. In most years, SJWD may divert up to 82,200 acre-feet.
- Drier years are defined as years when the projected March through November unimpaired inflow to Folsom Reservoir is less than 950,000 acre-feet and equal to or greater than the 400,000 acre-feet. In drier years, SJWD will divert a decreasing amount of surface water from 82,200 AF to 54,200 acre-feet in proportion to the decrease in unimpaired inflow to Folsom reservoir from 950,000 to 400,000 acre-feet. In drier years, SJWD will reduce its water demands by up to 15 percent and use groundwater to meet additional demands.
- Driest years (conference years) are defined as years when the projected March through November unimpaired inflow to Folsom Reservoir is less than 400,000 acre-feet. In the driest years, SJWD will reduce their diversion to 54,200 acre-feet, which is equivalent to their baseline amount (maximum diversion through 1995). In the driest years, SJWD will reduce its water demands by up to 15 percent and use groundwater to meet additional demands. SJWD will also meet with other Water Forum signatories to discuss how the available water should be managed to meet water purveyor demands and minimum flow requirements of the American River.

The Hodge decision can also legally constrain surface water diversions if minimum Hodge Flows in the Lower American River are not met. The Hodge decision was a judgment of the Superior Court for the County of Alameda (Environmental Defense Fund, Inc. v East Bay Municipal Utility District (EBMUD), Case No. 425955) that directed EBMUD to divert from

[38] Water Forum Agreement January 2000.

the lower American River based on its CVP contractual entitlement only when specified flows would remain in the river. These flows came to be known as Hodge Flows. The Hodge Flows are 2,000 cfs from October 15 through the end of February, 3,000 cfs from March 1 through June 30, and 1,750 cfs from July 1 through October 14. "Below Hodge Conditions" refers to conditions when bypassing flow at Sacramento's Fairbairn WTP is less than the defined Hodge Flows. Although the Hodge Decision applies only to parties to that lawsuit, Water Forum signatories volunteer to observe the flow requirements when reasonable and feasible.[39]

Demand and Supplies Reliability Comparison

San Juan Water District (SJWD) Supplies and Demands

As previously noted, the District is a member agency of the San Juan Family and receives surface water from SJWD. From SJWD's 2005 Urban Water Management Plan, wholesale supply information was obtained for a normal year, single-dry year, and multiple-dry years. The base year for a single-dry year is the 1976-1977 water year whereas the years 1987 to 1992 were selected as the multiple-dry years.

The existing water supplies are not expected to change in the future and will remain constant through 2030. SJWD holds surface water rights and contracts totaling 82,200 acre-feet as discussed in Section 2 of this Plan. Table 12 quantifies the water supplies available to SJWD.

Table 12 – Projected San Juan Water District Normal Year Wholesale Water Supplies (acre-feet per year)

Water Supply Sources	2010	2015	2020	2025	2030
Pre-1914 Water Rights	33,000	33,000	33,000	33,000	33,000
Placer County Water Agency Contract	25,000	25,000	25,000	25,000	25,000
USBR CVP Water Contracts	24,200	24,200	24,200	24,200	24,200
Total	**82,200**	**82,200**	**82,200**	**82,200**	**82,200**

Source: SJWD's 2005 Urban Water Management Plan (modified from Table 4-4)

SJWD's 2005 Urban Water Management Plan also provided water supply reliability information for each of their water supply sources during a single-dry year and multiple-dry years. Table 13 summarizes the wholesale supply reliability for the year 2025. As shown in Table 13, the water supplies available to SJWD during a single-dry year and multiple-dry years are the same. Although the SJWD 2005 Urban Water Management Plan completes their reliability analysis through 2025, it is assumed in this Plan that the 2030 supply projection is the same as the 2025 projection. This assumption is made because the supplies shown for a normal year, single-dry year, and multiple-dry years are constant from 2010 through 2025. SJWD assumes that the supplies for the single-dry year and multiple-dry years is the same as those supplies defined in the Water Forum Agreement for the driest years or conference years.

[39] SRWRS Partners, Sacramento River Water Reliability Study Initial Alternatives Report, March 2005.

Table 13 – San Juan Water District Wholesale Supply Reliability (acre-feet per year)[1]

Water Supply Sources	Single-Dry Year	Multiple-Dry Years			
		Year 1	Year 2	Year 3	Year 4
Pre-1914 Water Rights	33,000	33,000	33,000	33,000	33,000
Placer County Water Agency Contract	25,000	25,000	25,000	25,000	25,000
USBR CVP Water Contracts[2]	18,150	18,150	18,150	18,150	18,150
Total	**76,150**	**76,150**	**76,150**	**76,150**	**76,150**
Total Based on Water Forum Agreement Restrictions[3]	**54,200**	**54,200**	**54,200**	**54,200**	**54,200**

[1] Information is from SJWD's 2005 Urban Water Management Plan (modified from Table 4-5)
[2] USBR CVP water contracts are subject to a 25 percent reduction.
[3] The total water supply during a single-dry year and multiple-dry years may be further restricted by the Water Forum Agreement. SJWD assumes any reductions in surface water supplies will be replaced with groundwater supplies.

SJWD's 2005 Urban Water Management Plan also provided information regarding the demand on their wholesale supplies. Again, the reliability projections are provided through 2025, however, SJWD provided the District with their 2030 wholesale demand estimate separately from their 2005 Urban Water Management Plan. SJWD projects a 9.0 percent increase in the normal year demand from 2005 through 2030.

In estimating the single-dry year and multiple-dry year water demands, SJWD followed the assumption made in the preparation of the Regional Water Master Plan.[40] It was assumed that the overall demands in a single-dry year and multiple-dry years will not change from normal year demands because reduction programs implemented by water purveyors will offset the increased demand in irrigation.

Table 14 summarizes SJWD's current water supply availability projections for a normal year, single-dry year, and multiple-dry years over the 20-year period beginning in 2010 and ending in 2030. Based on these projections, SJWD will not be able to meet all of its projected single-dry year and multiple-dry year service area demands. SJWD assumes that those agencies with groundwater supplies will rely on groundwater to replace lost surface water supplies.

[40] San Juan Water District, Urban Water Management Plan, 2005. The Regional Water Master Plan was prepared by MWH in 2003.

Table 14 – San Juan Water District Surface Water Supply Reliability Projections for Normal, Single-Dry, and Multiple-Dry Years (acre-feet per year)

Row	Region Wide Projections	2010	2015	2020	2025	2030[1]
Supply Information[2]						
A	Projected Supply During a Normal Year	82,200	82,200	82,200	82,200	82,200
B	Projected Supply During a Single-Dry Year	54,200	54,200	54,200	54,200	54,200
C	Projected Supply During Year 4 of a Multiple-Dry Year Period [3]	54,200	54,200	54,200	54,200	54,200
D = B/A	Projected Supply During a Single-Dry Year as a % of Normal Supply	65.9%	65.9%	65.9%	65.9%	65.9%
E = C/A	Projected Supply During Year 4 of a Multiple-Dry Year as a % of Normal Supply	65.9%	65.9%	65.9%	65.9%	65.9%
Demand Information[2]						
F	Projected Demand During a Normal Year	64,447	66,190	67,093	67,728	67,760
G	Projected Demand During a Single-Dry Year	64,447	66,190	67,093	67,728	67,760
H	Projected Demand During Year 4 of a Multiple-Dry Year Period	64,447	66,190	67,093	67,728	67,760
I = G/F	Projected Demand During a Single-Dry Year as a % of Normal Demand	100%	100%	100%	100%	100%
J = H/F	Projected Demand During Year 4 of a Multiple-Dry Year as a % of Normal Demand	100%	100%	100%	100%	100%
Surplus Information						
K = A-F	Projected Surplus During a Normal Year	17,753	16,010	15,107	14,472	14,440
L = B-G	Projected Surplus During a Single-Dry Year	(10,247)	(11,990)	(12,893)	(13,528)	(13,560)
M = C-H	Projected Surplus During Year 4 of a Multiple-Dry Year Period	(10,247)	(11,990)	(12,893)	(13,528)	(13,560)

[1] Information provided by SJWD, but not included in their 2005 Urban Water Management Plan.
[2] Supply and demand information was obtained from SJWD's 2005 Urban Water Management Plan (Table 3-9, Table 7-1, and Table 7-2)
[3] Although SJWD projects water supplies for the four multiple-dry years, the supplies are the same for each year, thus only year 4 is reported in this table.

Fair Oaks Water District Supplies and Demands

Supplies

As mentioned earlier, the District has a contract to receive 15,000 acre-feet of surface water from SJWD. In the Water Forum Agreement, the San Juan Consortium committed to providing supplemental water (groundwater use, water rationing, and conservation) to decrease their use of surface water during the dry and driest years. The reduction in SJWD's normal wholesale surface water supply of 82,200 acre-feet to 54,200 acre-feet during a single-dry year and multiple-dry years means that up to 28,000 acre-feet of supplemental water may be needed by the San Juan Consortium.

The District's agreement for 15,000 acre-feet of surface water from SJWD originates from the pre-1914 water rights off of the American River that SJWD now owns. SJWD shows no reduction in this supply during a single-dry year or multiple-dry years as shown in Table 13 and therefore the entire 15,000 acre-feet of surface water is considered available to the District in a normal year, single-dry year, and multiple-dry years. The San Juan Family is signatory to the Water Forum Agreement and, as a Family, each share the responsibility for reduction of surface water supplies as well as increases in groundwater production. The District, recognizes the Water Forum Agreement and understands the importance of using groundwater supplies during drier periods to offset the use of surface water.

If surface water supplies are reduced below the contracted 15,000 acre-feet, the District will rely on its groundwater sources. The District will also implement conservation measures defined in their water contingency shortage plan as discussed in Section 7. At this time, the District anticipates meeting its water demands with surface water. The District may enter into an agreement with SJWD to pump groundwater in-lieu of purchasing surface water to assist the Family in meeting its water demands as discussed in Section 2. Table 16 through Table 22 only evaluate the District's supplies and demands and do not include the use of groundwater to meet the Family's demands during a single-dry year or multiple-dry years.

Demands

To establish a reasonable foundation from which to project future District demands, recent production records were reviewed to determine a basis for normal year usage. Table 15 summarizes production records for the past five full calendar years. The average production over that period (including groundwater and surface water usage) was 13,890 acre-feet per year.

Table 15 – Fair Oaks Water District Water Production
(acre-feet per year)

	2000	2001	2002	2003	2004	Average
Well Production	439	138	1,791	314	286	595
Surface Water	14,018	15,040	11,456	12,333	13629	13,295
Total Potable Demand	**14,457**	**15,178**	**13,247**	**12,647**	**13,915**	**13,890**

Table 16, shown for normal years 2010 through 2030, reflects a slight increase in demand based on the population projections referenced in Section 1 of this Plan. In projecting these increased demands, it has been reasonably assumed that water usage will increase at about half the rate of a population percentage increase, for example, a 1.0 percent annual increase in population will result in a 0.5 percent annual increase in demand. This is a sensible approach in that there is little land left for development in the District's service area, which means any increases in population will probably be reflected in higher densities per dwelling unit, with no concurrent increase in landscape irrigation or other non-residential water usage. However, the increase in water demand from 2005 to 2010 is assumed to be at the same rate of increase in population due to the additional connections associated with the Gum Ranch development. The percent increases are applied to the past five-year average water demand of 13,890 acre-feet per year.

SJWD did not project any increases in a single-dry year or multiple-dry year demand from a normal year demand. The District's water records resemble a similar trend. As shown in Table 5 the water demands during the 1987-1992 multiple-dry year period consistently decreased. During the drier years, the District is able to curtail the need for increased water supplies. Although historically for the District, demands decreased during drier periods, the demands shown in the following tables remain constant for a single-dry year and multiple-dry years as the wholesale demands did in SJWD's 2005 Urban Water Management Plan.

Table 16 through Table 22 compare projected water supplies and demands in a normal year, single-dry year, and multiple-dry year scenarios. The results displayed in these tables indicate that SJWD can meet all of the District's demands in a normal year, single-dry year, and multiple-dry years through 2030.

Table 16 – Fair Oaks Water District Water Supply Reliability Projections for a Normal Water Year

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2010**	**2015**	**2020**	**2025**	**2030**
Supply					
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
% of Normal Year[3]	100.0%	100.0%	100.0%	100.0%	100.0%
Demand					
Surface Water[4]	14,110	14,180	14,215	14,250	14,290
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**14,110**	**14,180**	**14,215**	**14,250**	**14,290**
% of Year 2004[7]	101.4%	101.9%	102.2%	102.4%	102.7%
Difference in Supply to Demand	**9,790**	**9,720**	**9,685**	**9,650**	**9,610**
Difference as % Supply	**41.0%**	**40.7%**	**40.5%**	**40.4%**	**40.2%**
Difference as % of Demand	**69.4%**	**68.5%**	**68.1%**	**67.7%**	**67.2%**

[1] Surface water supplies are equal to the District's agreement with SJWD.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supply is assumed to reflect the total supply available in the row labeled "Total Supply".

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand in 2010 is estimated by assuming the percent increase in population applies to water demand. Total demand for 2015 through 2030 is estimated by assuming water usage will increase at about half the rate of population.

[7] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Table 17 – Fair Oaks Water District Water Supply Reliability Projections for a Single-Dry Water Year

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2010**	**2015**	**2020**	**2025**	**2030**
Supply					
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
Normal Year Supply[3]	23,900	23,900	23,900	23,900	23,900
% of Normal Year	100.0%	100.0%	100.0%	100.0%	100.0%
Demand					
Surface Water[4]	14,110	14,180	14,215	14,250	14,290
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**14,110**	**14,180**	**14,215**	**14,250**	**14,290**
Normal Year Demand[3]	14,110	14,180	14,215	14,250	14,290
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
% of Year 2004[7]	101.4%	101.9%	102.2%	102.4%	102.7%
Difference in Supply to Demand	**9,790**	**9,720**	**9,685**	**9,650**	**9,610**
Difference as % Supply	**41.0%**	**40.7%**	**40.5%**	**40.4%**	**40.2%**
Difference as % of Demand	**69.4%**	**68.5%**	**68.1%**	**67.7%**	**67.2%**

[1] Surface water supplies for a single-dry year are assumed to be the same as the supply in a normal year; however, future agreements with SJWD may require cutbacks in surface water to meet the obligations of the Water Forum Agreement. The cutbacks in surface water will be met with groundwater supplies.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supplies and demands are taken from Table 16.

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand is assumed to equal the demand in a normal year and taken from Table 16.

[7] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Table 18 – Fair Oaks Water District Water Supply Reliability Projections for Multiple-Dry Water Years 2006-2010

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2006**	**2007**	**2008**	**2009**	**2010**
Supply	**Normal Year**	**Dry Years**			
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
Normal Year Supply[3]	23,900	23,900	23,900	23,900	23,900
% of Normal Year	100%	100%	100%	100%	100%
Demand					
Surface Water[4]	12,820	13,145	13,465	13,790	14,110
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**12,820**	**13,145**	**13,465**	**13,790**	**14,110**
Normal Year Demand[7]	12,820	13,145	13,465	13,790	14,110
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
% of Year 2004[8]	92.1%	94.5%	96.8%	99.1%	101.4%
Difference in Supply to Demand	**11,080**	**10,755**	**10,435**	**10,110**	**9,790**
Difference as % Supply	**46.4%**	**45.0%**	**43.7%**	**42.3%**	**41.0%**
Difference as % of Demand	**86.4%**	**81.8%**	**77.5%**	**73.3%**	**69.4%**

[1] Surface water supplies are interpolated and are assumed to be the same as the supply in a normal year; however, future agreements with SJWD may require cutbacks in surface water to meet the obligations of the Water Forum Agreement. The cutbacks in surface water will be met with groundwater supplies.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supplies are taken from Table 16.

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand is assumed to equal the demand in a normal year.

[7] Normal year demand is interpolated between 2005 demand of 12,500 acre-feet (Table 4) to the 2010 demand as shown in Table 16.

[8] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Table 19 – Fair Oaks Water District Water Supply Reliability Projections for Multiple-Dry Water Years 2011-2015

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2011**	**2012**	**2013**	**2014**	**2015**
Supply	**Normal Year**	**Dry Years**			
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
Normal Year Supply[3]	23,900	23,900	23,900	23,900	23,900
% of Normal Year	100%	100%	100%	100%	100%
Demand					
Surface Water[4]	14,125	14,140	14,150	14,165	14,180
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**14,125**	**14,140**	**14,150**	**14,165**	**14,180**
Normal Year Demand[7]	14,125	14,140	14,150	14,165	14,180
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
% of Year 2004[8]	101.5%	101.6%	101.7%	101.8%	101.9%
Difference in Supply to Demand	**9,775**	**9,760**	**9,750**	**9,735**	**9,720**
Difference as % Supply	**40.9%**	**40.8%**	**40.8%**	**40.7%**	**40.7%**
Difference as % of Demand	**69.2%**	**69.0%**	**68.9%**	**68.7%**	**68.5%**

[1] Surface water supplies are interpolated and are assumed to be the same as the supply in a normal year; however, future agreements with SJWD may require cutbacks in surface water to meet the obligations of the Water Forum Agreement. The cutbacks in surface water will be met with groundwater supplies.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supplies are taken from Table 16.

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand is assumed to equal the demand in a normal year.

[7] Normal year demand is interpolated between 2010 and 2015 as shown in Table 16.

[8] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Table 20 – Fair Oaks Water District Water Supply Reliability Projections for Multiple-Dry Water Years 2016-2020

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2016**	**2017**	**2018**	**2019**	**2020**
Supply	**Normal Year**	**Dry Years**			
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
Normal Year Supply[3]	23,900	23,900	23,900	23,900	23,900
% of Normal Year	100%	100%	100%	100%	100%
Demand					
Surface Water[4]	14,190	14,195	14,200	14,210	14,215
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**14,190**	**14,195**	**14,200**	**14,210**	**14,215**
Normal Year Demand[7]	14,190	14,195	14,200	14,210	14,215
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
% of Year 2004[8]	102.0%	102.0%	102.0%	102.1%	102.2%
Difference in Supply to Demand	**9,710**	**9,705**	**9,700**	**9,690**	**9,685**
Difference as % Supply	**40.6%**	**40.6%**	**40.6%**	**40.5%**	**40.5%**
Difference as % of Demand	**68.4%**	**68.4%**	**68.3%**	**68.2%**	**68.1%**

[1] Surface water supplies are interpolated and are assumed to be the same as the supply in a normal year; however, future agreements with SJWD may require cutbacks in surface water to meet the obligations of the Water Forum Agreement. The cutbacks in surface water will be met with groundwater supplies.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supplies are taken from Table 16.

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand is assumed to equal the demand in a normal year.

[7] Normal year demand is interpolated between 2015 and 2020 as shown in Table 16.

[8] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Table 21 – Fair Oaks Water District Water Supply Reliability Projections for Multiple-Dry Water Years 2021-2025

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2021**	**2022**	**2023**	**2024**	**2025**
Supply	**Normal Year**	**Dry Years**			
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
Normal Year Supply[3]	23,900	23,900	23,900	23,900	23,900
% of Normal Year	100%	100%	100%	100%	100%
Demand					
Surface Water[4]	14,220	14,230	14,235	14,245	14,250
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**14,220**	**14,230**	**14,235**	**14,245**	**14,250**
Normal Year Demand[7]	14,220	14,230	14,235	14,245	14,250
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
% of Year 2004[8]	102.2%	102.3%	102.3%	102.4%	102.4%
Difference in Supply to Demand	**9,680**	**9,670**	**9,665**	**9,655**	**9,650**
Difference as % Supply	**40.5%**	**40.5%**	**40.4%**	**40.4%**	**40.4%**
Difference as % of Demand	**68.1%**	**68.0%**	**67.9%**	**67.8%**	**67.7%**

[1] Surface water supplies are interpolated and are assumed to be the same as the supply in a normal year; however, future agreements with SJWD may require cutbacks in surface water to meet the obligations of the Water Forum Agreement. The cutbacks in surface water will be met with groundwater supplies.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supplies are taken from Table 16.

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand is assumed to equal the demand in a normal year.

[7] Normal year demand is interpolated between 2020 and 2025 as shown in Table 16.

[8] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Table 22 – Fair Oaks Water District Water Supply Reliability Projections for Multiple-Dry Water Years 2026-2030

Projected Water Supply and Demand (acre-feet/year)					
Water Sources	**2026**	**2027**	**2028**	**2029**	**2030**
Supply	**Normal Year**	**Dry Years**			
Surface Water[1]	15,000	15,000	15,000	15,000	15,000
Groundwater[2]	8,900	8,900	8,900	8,900	8,900
Total Supply	**23,900**	**23,900**	**23,900**	**23,900**	**23,900**
Normal Year Supply[3]	23,900	23,900	23,900	23,900	23,900
% of Normal Year	100%	100%	100%	100%	100%
Demand					
Surface Water[4]	14,260	14,265	14,275	14,280	14,290
Groundwater[5]	0	0	0	0	0
Total Demand[6]	**14,260**	**14,265**	**14,275**	**14,280**	**14,290**
Normal Year Demand[7]	14,260	14,265	14,275	14,280	14,290
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
% of Year 2004[8]	102.5%	102.5%	102.6%	102.6%	102.7%
Difference in Supply to Demand	**9,640**	**9,635**	**9,625**	**9,620**	**9,610**
Difference as % Supply	**40.3%**	**40.3%**	**40.3%**	**40.3%**	**40.2%**
Difference as % of Demand	**67.6%**	**67.5%**	**67.4%**	**67.4%**	**67.2%**

[1] Surface water supplies are interpolated and are assumed to be the same as the supply in a normal year; however, future agreements with SJWD may require cutbacks in surface water to meet the obligations of the Water Forum Agreement. The cutbacks in surface water will be met with groundwater supplies.

[2] Groundwater supplies are assumed to be 80 percent of the total well system design capacity assuming the largest producing well is out of service as shown in Table 7. The supplies include the proposed wells discussed in Section 2. In the future, an additional 2,000 gpm of remediated groundwater may be available to the District from Aerojet. Section 3 describes this source of supply in more detail.

[3] Normal year supplies are taken from Table 16.

[4] Surface water demand is the difference between total demand and groundwater.

[5] Groundwater demand is assumed to be zero since there is sufficient surface water to meet the District's water demand.

[6] Total demand is assumed to equal the demand in a normal year.

[7] Normal year demand is interpolated between 2025 and 2030 as shown in Table 16.

[8] Because the District operates on a calendar year basis, complete water usage data for 2005 are not yet available so 2004 calendar year usage is used in this table; total water usage for 2004 was 13,915 acre-feet.

Planned Water Supply Projects and Programs to Meet Projected Water Use

Fair Oaks Water District Projects

The District continually reviews practices that will provide its customers with adequate and reliable supplies. Trained staff continues to ensure the water quality is safe and the water supply will meet present and future needs in an environmentally and economically responsible manner. The District consistently coordinates its long-term water shortage planning with SJWD, the Water Forum, and SGA.

The District projects water demand within its service area could remain relatively constant with a slight increase over the next 20 years due to minimal growth combined with water use efficiency measures. Proposed water supply sources will be to replace or upgrade inefficient wells, rather than to support large population growth. The projects that have been identified to improve the District's water supply reliability and enhance the operations of the District's facilities include replacement of fire hydrants, valves, and pipelines. The improvement projects identified for production purposes are discussed below:

Groundwater Well Projects

As mentioned earlier, the ARBCUP includes 12 projects that will enhance the conjunctive use of surface water and groundwater to ensure sustainability of the region's water resources. Two of the project components are within the District and include the Vintage Woods Well Groundwater Storage and Recovery Project and the Upgrade of Heather Well Groundwater Storage and Recovery Project. The District is in the process of planning for the construction of both groundwater wells. Based on preliminary studies, the Vintage Woods Well is not expected to produce the capacity originally expected. As a result, the District is replacing the Vintage Woods Well project with the construction of a new well located at the existing Town Well site. This change has been approved by RWA. The two projects are described below and the additional water supplies to the District are provided in Table 23 on the following page.

- The proposed Town Well, Well #10, will be completed in 2006 and is anticipated to have a capacity of 2,000 gpm. This well will replace the existing Town Well (Well #1). The design capacity of the existing Town Well is 1,200 gpm. Therefore, the new well will yield approximately 800 gpm in addition design capacity for the District.
- The proposed Heather Well, Well #11, will be completed in 2006 and is anticipated to have a capacity of 1,500 gpm. This well replaces the existing Heather Well (Well #5). The capacity of the existing Heather Well is 1,500 gpm. Therefore, the new well is for replacement purposes only.

Table 23 – Future Water Supply Projects
(acre-feet per year)

			Multiple-Dry Years			
Project Name	**Normal Year**	**Single-Dry Year**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Proposed Town Well, Well #10	1,032	1,032	1,032	1,032	1,032	1,032

Notes: Although 800 gpm of additional design capacity will be available to the District after the construction of Well #10, the groundwater supplies available to the District are assumed to be 80 percent of the well's capacity.

Another groundwater well is anticipated to serve the proposed Gum Ranch Development. The District is in the process of annexing the 90 acre area that will have approximately 350 new homes. The District will be evaluating the water needs of the development in the future and anticipates that a new well will be needed by 2010. The capacity of the new well is not known at this time.

Metering Program

The District is implementing a meter installation program to comply with the CVPIA. In 1992, the CVPIA required all USBR water contractors to install individual meters. Because the District receives water from SJWD, a CVP water contractor, the District is installing meters at all customer connections. The meters are being installed at rate of up to 1,000 meters per year. The District anticipates having all residential connections metered by 2010. Commercial connections are already metered. Metered rates for residential customers will take affect in 2012.

Water Master Plan preparation

The District is in the process of updating its 1988 Water Systems Master Plan. The Water Master Plan will be completed in 2006.

Pipeline Projects

Because of aging infrastructure, the District is proposing the replacement of 15,000 feet of transmission mains. The transmission main replacements will range from 24-inch to 40-inch in diameter. The replacement of pipe will be implemented between 2010 and 2025.

Tank Projects

The District is considering a joint project with Orange Vale Water Company and Citrus Heights Water District to construct a water storage tank to benefit the three districts. A preliminary study will be completed to determine the location and size of the tank. The project has not been approved by the three districts and therefore timing and capacity are unknown at this time.

San Juan Water District Projects

Since the District purchases surface water from SJWD, the projects implemented by SJWD to secure their water supplies improves water supply reliability for the District. Some of the projects being pursued or recently completed by SJWD include:

- SJWD actively meets with USBR to discuss any operational changes for Folsom Reservoir that may impact SJWD's water supply reliability. USBR and DWR are proposing to coordinate the operations of the CVP and State Water Project. Some of the proposed actions may impact Folsom Reservoir water supplies such as increased pumping at Banks Pumping Plant, permanent barriers operated in the South Delta, a long-term EWA, the Freeport Regional Water Project, and various operational changes. Based on discussions between SJWD and USBR, the potential impacts are minimal.[41] SJWD will continue to discuss the operation of Folsom Reservoir with USBR and the Cities of Folsom and Roseville and El Dorado Irrigation District. Quarterly meetings with USBR Folsom Dam operations personnel were established in May of 2005 to discuss operations and constraints of water supply in conjunction with USBR's operation and maintenance activities.
- The SJWD and the Cities of Folsom and Roseville are concerned about the reliability of the USBR raw water facilities from Folsom Reservoir. The diverters of surface water have proposed a parallel pipeline and second intake structure to be used during planned maintenance or in the event of emergency outages on the existing facilities. To date, USBR has not been receptive to the proposed project. SJWD continues to meet with USBR to discuss this project.
- SJWD is currently finalizing their Wholesale Master Plan. The Wholesale Master Plan will include historical water demand information and proposed water demands for each family agency through 2030. In addition, a dry year analysis of surface and groundwater supplies will be completed with a discussion on demand reduction strategies and potential supplemental water supplies. The Wholesale Master Plan will also evaluate transmission and storage facilities for adequate capacity during normal and emergency operations. The Wholesale Master Plan is expected to be released as a draft in 2006.
- SJWD has recently completed construction of the Water Treatment Plant Betterments Project. This projected expanded the plant's capacity and enhanced treatment facilities.
- SJWD, through RWA's proposal for Proposition 50 grant funding for implementation projects, is requesting funds for three projects. The projects include: 1) improvements to the raw water piping including a parallel pipeline and rehabilitation of the existing pipeline; 2) modifications and improvements to Hinkle Reservoir (bifurcating the reservoir and improving inlet and outlet structures and piping); and 3) relocating the connection point of the Cooperative Transmission Pipeline to Hinkle Reservoir.[42] The

[41] San Juan Water District, Board of Director's meeting minutes, January 26, 2005.
[42] San Juan Water District, Board of Director's meeting minutes, April 27, 2005.

Cooperative Transmission Pipeline is 78 inches in diameter at SJWD's headworks and is designed to provide surface water deliveries to Citrus Heights Water District, SJWD, Orange Vale Water Company, Sacramento Suburban Water District, and the District.

Sacramento Groundwater Authority (SGA) Projects

The projects implemented by SGA to protect and manage the Basin also improve water supply reliability for the District. Some of the projects being pursued by SGA include:

- In June 2004, SGA received a grant from DWR under the AB303 Local Groundwater Assistance (LGA) Program. The project is the Regional Monitoring Well Network Project and will include the construction of up to 11 monitoring wells. The wells will provide valuable groundwater data for inclusion in the Data Management System.
- SGA submitted an application to the DWR 2005 LGA program requesting funds to update the Integrated Groundwater and Surface Water Model for the Sacramento region's North Area Groundwater Basin in late 2004. In April 2005, SGA was ranked second out of 75 applicants by DWR for possible funding. The first phase of this project is being funded through the RWA's Integrated Regional Water Management Planning Program. The recent LGA grant would fund the second phase which includes calibration and development of a baseline conditions model.

Regional Agency Projects

Although the following projects will not increase water supply for the District, they are important to the long-term water supply reliability of the Sacramento region north of the American River near the District.

- The Sacramento River Water Reliability Study (SRWRS) was initiated in 2002 to evaluate various alternatives for diverting water from the Sacramento River to meet growing demands within the Placer-Sacramento County region. Because of the Water Forum Agreement and other water supply limitations on the American River, the SRWRS will increase the region's water supply flexibility and reliability. The SRWRS will also improve flows for ecosystem preservation of the Lower American River. The SRWRS project will provide Sacramento River water to Placer County Water Agency, Sacramento Suburban Water District, City of Roseville, and the City of Sacramento in-lieu of deliveries from the American River. The SRWRS project was identified in the Water Forum Agreement and is currently in the planning stage.
- American River Pump Station Project – A project upstream of Folsom Reservoir is the American River Pump Station Project. The purpose of this project is to 1) provide facilities to allow Placer County Water Agency to convey its Middle Fork Project water entitlement (35,000 acre-feet) to the Auburn Ravine Tunnel to meet demands within its service area; 2) eliminate the safety issue associated with the Auburn Dam construction bypass tunnel; and 3) allow for all pre-construction beneficial uses of

water in the dewatered river channel.[43] The final Environmental Impact Statement/Environmental Impact Report (EIR) was completed in 2002 and construction began in 2003. The project is anticipated to be complete in 2006.[44]

Transfer and Exchange Opportunities

At this time, the District does not anticipate participating in any transfer or exchange opportunities. Other agencies within the region such as RWA and SGA are exploring options that would benefit the region. These exchanges would most likely be part of the region's conjunctive use plan.

Although not a proposed transfer opportunity, the District participated in the CALFED Environmental Water Account (EWA) program in 2002. EWA is a program designed to provide flexibility to the State's water delivery system. The purpose of EWA is to supply water at critical times to meet environmental needs without impacting water supplies for cities, farms, and businesses.[45] EWA was implemented to provide solutions to two main problems; declining fish populations and unreliable water sources. EWA is able to purchase water from willing sellers and/or divert excess water and then banks, stores, transfers and releases it as needed to protect fish and compensate water users.

As part of the agreement between SGA and EWA, The total amount of surface water transferred to EWA from SGA was 7,143 acre-feet of which 4,646 acre-feet came from SJWD. As a result, the District reduced their surface water supply by 2,501.5 acre-feet and relied on groundwater.[46] In the future, SGA may wish to participate in the EWA program as needed to enhance the beneficial uses within California. The District, however, will decide at that time if participating in the program meets their needs.

Desalinated Water Opportunities

Desalination is viewed as a way to develop a local, reliable source of water that assists agencies to reduce their demand on surface water, reduce groundwater overdraft, and in some cases make unusable groundwater available for municipal uses. At this time, there are no identified projects within the District for desalination of seawater or impaired groundwater. Within the State of California, however, a number of desalination projects are being investigated and proposed. A few of the desalinated water opportunities facing California and the Northern California region are described below although they will not directly benefit the District at this time.

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[43] PCWA and USBR, American River Pump Station Project Executive Summary of the Final Environmental Impact Statement/Environmental Impact Report, June 2002.

[44] SRWRS Partners, SRWRS Initial Alternatives Report, March 2005.

[45] CALFED Bay-Delta Program's Environmental Water Account Facts and Background, available online at http://calwater.ca.gov/Programs/EnvironmentalWaterAccount/FactSheet.htm.

[46] SGA EWA Pilot Study, no date.

Department of Water Resources Desalination Task Force

Assembly Bill 2717 called for DWR to establish a Desalination Task Force to evaluate the following: 1) potential opportunities for desalination of seawater and brackish water in California, 2) impediments to using desalination technology, and 3) the role of the State in furthering the use of desalination.[47] The task force was comprised of 27 organizations and in October 2003 the task force provided a list of recommendations related to the following issues/categories: general, energy, environment, planning, and permitting. The list of recommendations can be found at DWR's water use efficiency website: www.owue.water.ca.gov/recycled/index.cfm.

Northern California Salinity Program

In 2003, eight San Francisco Bay Area water agencies located in Northern California formed the Northern California Salinity Coalition (Coalition) to address regional salinity issues. The agencies formed the Coalition because they recognized that salinity in Northern California will affect future uses of the region's water supplies.

Members of the Coalition are committed to protecting Northern California's water supplies from salt contamination and to advancing desalination technology. The Coalition's objectives are to define priorities and action plans, identify funding opportunities, and establish a framework for regional cooperation in addressing desalination and salinity issues in order to improve water supply reliability and reduce salinity-related problems affecting the water supplies of its members. The Coalition is focusing its efforts in the following areas: seawater desalination, brackish groundwater desalination, salinity increases in groundwater basins and the impact on water supplies, seawater intrusion, control of salinity in wastewater to improve recycling options for irrigation or industrial use, and other related issues.[48]

Department of Water Resources Proposition 50 Funding

In January 2005, DWR received 42 eligible applications requesting $71.3 million from funds available through Proposition 50. Proposition 50, the Water Quality, Supply and Safe Drinking Water Projects, Coastal Wetlands Purchase and Protection Act was passed by voters in 2002. Projects eligible for the program include construction projects, research and development, feasibility studies, pilot projects, and demonstration programs. Local agencies, water districts, academic and research institution will be able to use the funds in the development of new water supplies through brackish water and seawater desalination.

DWR is recommending funding for 25 of the 42 projects with the available $25 million under the current desalination grant cycle. With this funding recommendation, 54 percent of the fund will support brackish water desalination related projects and 46 percent will support ocean desalination related projects. Seven member agencies of the Northern California Salinity Coalition have been recommended to receive nearly $7.8 million of the available funding for their desalination and recycled water projects.

[47] DWR, California Water Plan Update 2005, Volume 2 – Resource Management Strategies.
[48] National Water Research Institute webpage: http://www.nwri-usa.org/asp/sp.asp?main=m5&sub=s12&id=53

The 25 projects recommended for funding include facilities in Marin and Alameda counties. Pilot projects in Long Beach, Santa Cruz, San Diego and Los Angeles are among those that will receive grants under the proposed funding plan. Research and development activities at the Lawrence Livermore National Laboratory and the University of California, Los Angeles are included in the recommendations, as are feasibility studies by agencies in the Bay Area, Monterey, and Riverside County.

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Section 5 – Water Use Provisions

This section quantifies the past, current, and projected water use among water use sectors.

Past, Current, and Projected Water Use Among Sectors

The past, current, and projected water service connections by sector are shown in Table 24. The mix of residential and non-residential connections remains essentially constant at about 95 percent residential through 2030. The increase in the number of service connections is consistent with the projected population increase described in Section 1 through 2015. Although population is anticipated to continue to increase through 2030, the number of connections will stabilize after 2015 because the District will have reached build-out within its service area.

Water demand projections are anticipated to remain relatively stable through the year 2030. The water use by sector is estimated and shown in Table 25. The increase in water demands is mostly attributed to an increase in population associated with the single-family residential land use. The increase in connections is related to the Gum Ranch Development that will include approximately 350 homes. Most of these homes will be in place by 2010 although additional homes are assumed to be connected to the distribution system by 2015. The demands and number of connections for the other land use categories were kept essentially the same since the number of connections and usage has not fluctuated much over the past four years.

Unaccounted-for water use is unmetered water use such as for fire protection and training, system flushing, sewer cleaning, construction, system leaks, and unauthorized connections. Unaccounted-for water also results from meter inaccuracies. Since the District is not completely metered, data are unavailable for determining the percent of unaccounted-for water. Unaccounted-for water is generally assumed to be approximately 10 percent of total water production.

Table 24 – Number of Water Service Connections by Sector

Water Use Sector		2000	2005	2010	2015	2020	2025	2030
Single Family Residential	Meters	-	5,649	10,649	13,048	13,058	13,058	13,058
	No meter	-	7,034	2,349	-	-	-	-
	Total[1]	12,683	12,683	12,998	13,048	13,058	13,058	13,058
Multi-Family Residential	Metered[2]	38	247	250	255	255	255	255
Commercial	Metered[2]	354	526	530	535	535	535	535
Institutional	Metered	16	21	21	21	21	21	21
Landscape and Recreation	Metered[2]	56	67	70	74	74	74	74
Total Connections		**13,147**	**13,544**	**13,869**	**13,933**	**13,943**	**13,943**	**13,943**

[1] The District initiated its meter installation program in 2003 and is installing meters at a rate of up to 1,000 meters per year. Although some connections have a meter, the usage is not recorded by the District and therefore residential connections are not considered metered. The metered rate will take affect in 2012 and at that time the residential connections will be considered metered connections.

[2] Most of the connections in 2000 were metered although detailed information was not available. These connections are currently metered.

Table 25 – Past, Current and Projected Water Use by Sector (acre-feet per year)

Water Use Sector		2000	2005	2010	2015	2020	2025	2030
Single Family Residential	Metered	-	-	-	10,364	10,395	10,427	10,463
	Unmetered	10,870	8,918	10,341	-	-	-	-
	Total[1]	10,870	8,918	10,341	10,364	10,395	10,427	10,463
Multi-Family Residential	Metered	744	883	892	910	910	910	910
Commercial	Metered	1,018	1,103	1,113	1,124	1,124	1,124	1,124
Institutional	Metered	143	175	175	175	175	175	175
Landscape and Recreation	Metered	236	171	178	189	189	189	189
Unaccounted for System Losses[1]	Unmetered	1,446	1,250	1,411	1,418	1,422	1,425	1,429
Total Water Use		**14,457**	**12,500**	**14,110**	**14,180**	**14,215**	**14,250**	**14,290**

[1] Although the District has installed residential meters on connections, the District is not charging its customers based on a metered rate until 2012. At this time the District does not record usage from those meters that are in place and therefore water use is classified as unmetered.

[2] Estimated at 10 percent of total production

Section 6 – Water Demand Management Measures

Introduction

In 1998, the District became signatory to the Memorandum of Understanding (MOU) Regarding Best Management Practices (BMPs) for Urban Water Conservation with the California Urban Water Conservation Council (CUWCC). The MOU resulted from a consensus-building effort between DWR, water utilities, environmental organizations, and other interested groups committed to reducing the consumption of California's water resources. The intent was to develop a list of urban BMPs for conserving water, thereby reducing water supply needs.

Determination of DMM Implementation

As signatory to the MOU, the District has committed to a good faith effort in implementing the 14 cost-effective BMPs (the 14 BMPs are consistent with the 14 Demand Management Measures (DMM) as listed in the Act). "Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in each BMP's definition, and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in the MOU. A BMP as defined in the MOU is a "practice for which sufficient data are available from existing water conservation practices to indicate that significant conservation or conservation related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water agencies to carry out."

The MOU defines 14 BMPs, which are generally recognized as standard definitions of water conservation measures. These measures include technologies and methodologies that have been sufficiently documented in multiple demonstration projects that result in more efficient water use and conservation. The 14 BMPs include:

BMP 1. Water survey programs for single-family residential and multi-family residential customers

BMP 2. Residential plumbing retrofit

BMP 3. System water audits, leak detection, and repair

BMP 4. Metering with commodity rates for all new connections and retrofit of existing connections

BMP 5. Large landscape conservation programs and incentives

BMP 6. High-efficiency washing machine rebate programs

BMP 7. Public information programs

BMP 8. School education programs

BMP 9. Conservation programs for commercial, industrial, and institutional accounts

BMP 10. Wholesale agency programs (does not apply to the District)

BMP 11. Conservation pricing

BMP 12. Water conservation coordinator

BMP 13. Water waste prohibition

BMP 14. Residential ultra-low-flush toilet replacement programs

As signatory to the MOU, the District is responsible for completing and submitting BMP Activity Reports to the CUWCC every two years for each year prior. The District's BMP Activity Report is a comprehensive document that shows implementation of each BMP. Appendix H includes the most recent Activity Reports for reporting years 2002, 2003, and 2004. The Coverage Reports for 2001-2002 and 2003-2004 are also included in Appendix H. These documents collectively show that the District continues to actively implement the 14 BMPs described above in order to reduce overall water demand and assist in water reliability for the region.

Water Forum

As mentioned earlier, the District is a member of the Water Forum. The Water Forum Agreement contains a Water Conservation Element that requires water purveyors to prepare annual reports on the implementation of their negotiated Water Forum Water Conservation Plans.[49] The District's Water Conservation Plan consists of BMPs and a list of implementation criteria for each BMP. The BMPs defined in the Water Conservation Plan were adapted from the 14 BMPs established by CUWCC and customized for the Water Forum's conservation plans for each water purveyor. The District's Water Conservation Plan is included in the Water Forum Agreement and includes the following BMPs in addition to a Citizens Involvement Program:

BMP 1. Interior and exterior water audits and incentive programs for single-family residential, multi-family residential, and institutional customers

BMP 2. Plumbing retrofit of existing residential accounts

BMP 3. Distribution system water audits, leak detection, and repair

BMP 4. Non-residential and residential meter retrofit

BMP 5. Large landscape water audits and incentives for commercial, industrial, institutional (CII), and irrigation accounts

BMP 6. Landscape water conservation requirements for new and existing commercial, industrial, institutional and multi-family development

BMP 7. Public information programs

BMP 8. School education programs

[49] Water Forum Year Three Water Conservation Report, September 2004.

BMP 9. Commercial and industrial (CI) water conservation programs

BMP 11. Conservation pricing for metered accounts

BMP 12. Landscape water conservation for new/existing single-family homes

BMP 13. Water waste prohibition

BMP 14. Water conservation coordinator

BMP 16. Ultra-low-flush toilet replacement programs for non-residential customers

The Water Forum summarizes the progress of each of the signatories in meeting the requirements of their Water Conservation Plan in an annual progress report. The year 2004 marked the fourth year of implementation. Based on the latest progress report, Year Three Water Conservation Report, the District fully implemented ten BMPs.

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Section 7 – Water Shortage Contingency Plan

This section provides information on the District's Water Conservation Requirements and Enforcement Measures (known herein as the Water Shortage Contingency Plan); consisting of stages and actions implemented during a water supply shortage. Because the Water Shortage Contingency Plan for the District has not changed since 2001, a significant portion of this section is repeated from the 2001 Plan.

Introduction

California's extensive system of water supply infrastructure, its reservoirs, groundwater basins, and inter-regional conveyance facilities, mitigates the effect of short-term dry periods. Defining when a drought begins is a function of drought impacts to water users. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Droughts occur slowly, over a multiple year period. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. In addition to climate, other factors that can cause water supply shortages are earthquakes, chemical spills, and energy outages at treatment and pumping facilities.

In order to meet short-term water demand deficiencies, and short or long-term drought requirements, the District has implemented precautionary measures. The District will implement its own water shortage policy in accordance with the District's Water Shortage Contingency Plan and with SJWD's shortage/drought activities. The District has five inter-ties with neighboring water purveyors to assist in short-term emergency situations if needed. The District has also completed its Vulnerability Assessment to identify significant hazards and predict the impacts on the District's water system.

Water Shortage Contingency Plan

Stages of Action

In 1991, the District developed and adopted a five stage water conservation plan (Resolution No. 9609). In 2001, the District modified the Water Conservation Requirements and Enforcement Measures and adopted the amended plan on June 12, 2001 (Resolution No. 0109). A copy of Resolution No. 0109, also known as the District's Water Shortage Contingency Plan, is located in Appendix I. The purpose of the Water Shortage Contingency Plan is to provide a guide to deal with extended water shortages in a timely and systematic manner. It provides procedures, rules, and regulations for mandatory water conservation that gain results while minimizing the effect of a water shortage on the District's customers.

The District has developed five stages of action to be taken in response to water supply shortages, up to 50 percent. The stages and their appropriate water supply condition are listed below:

- Stage 1 – Normal Water Supply: The District's water supply or distribution system is able to meet all the normal water demands of its customers in the immediate future.
- Stage 2 – Water Alert: There is a probability that the District's water supply or distribution system is not able to meet all the water demands of its customers.
- Stage 3 – Water Warning: The District's water supply or distribution system is not able to meet all the water demands of its customers.
- Stage 4 – Water Crisis: The District's water supply or distribution system is not able to meet all the water demands of its customers under Stage 3 requirements.
- Stage 5 – Water Emergency: The District is experiencing a major failure of water supply, storage, or distribution system facilities.

Table 26 summarizes the list of the stages and their applicable percent reduction in demand. The Board of Directors of the District will determine the appropriate water supply stage and the customers will be notified. Upon notice, the water conservation measures set for that specific stage will apply to all customers until a different stage/condition is declared. The actions required at each stage and the types of enforcement action that can be taken by the District are discussed later in this section.

Table 26 – Water Supply Shortage Stages and Conditions

Conservation Stage	Percent Reduction
Stage 1 - Normal Water Supply	Normal Demand
Stage 2 - Water Alert	5-10%
Stage 3 - Water Warning	11-25%
Stage 4 - Water Crisis	26-50%
Stage 5 - Water Emergency	>50%

Note: When predicted supply shortage conditions fall within one of the ranges listed, the condition will act as a triggering mechanism for implementation of the appropriate stage. If implementation of that stage failed to provide the desired reduction in demand, the District may implement the next higher stage.

Priority by Use

Conditions prevailing in the District's service area require that the water resources available be put to maximum beneficial use to the extent to which they are capable. The waste or unreasonable use, or unreasonable method of use, of water should be prevented. The District encourages water conservation and water use efficiency to their maximum and reasonable beneficial use, however, all actions must be within the interests of District customers and the public welfare. Preservation of health and safety will be a top priority for the District.

Estimate of Minimum Supply for the Next Three Years

As mentioned earlier, the District has both surface water and groundwater supplies. The surface water entitlements from SJWD are for up to 15,000 acre-feet per year. Although there are no restrictions in the District's contract with SJWD, the District may voluntarily reduce its surface water deliveries and depend on groundwater sources. The reductions in SJWD's

surface water supplies are defined in the Water Forum Agreement and are discussed in Section 4. Table 27 lists the minimum water supply values for the three consecutive driest years. If the District's surface water supplies were reduced, the District could depend on groundwater to meet its demands. The District has the ability to meet water demand through the next three years based on the driest historic three years.

Table 27 – Minimum Water Supply Based on Driest 3-Year History (acre-feet)

Water Supply	Multiple-Dry Year			Normal
	2006	2007	2008	
Surface Water	15,000	15,000	15,000	15,000
Ground Water	8,900	8,900	8,900	8,900
Total	23,900	23,900	23,900	23,900

Note: The driest three-year sequence is assumed to result in the supply restrictions defined in the Water Forum Agreement for the "driest" years. Surface water and groundwater supplies for the multiple-dry years are shown in Table 18.

Catastrophic Supply Interruption Plan

A water shortage emergency could be the result of a catastrophic event such as a drought, failure of transmission facilities, regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions. In 1999, the District prepared a Vulnerability Assessment of the District's water system. The three major hazards to the system are drought, groundwater contamination, and fire. Other hazards such as surface water contamination, power outages, flood events, earthquakes, and distribution failures are considered secondary hazards because the probability of occurrence is low or the consequences resulting from the event are not serious.

The Vulnerability Assessment provides recommendations to mitigate for the likely consequences to the hazards most critical to the operations of the District. Recommendations to minimize the consequences of hazards include drilling new wells, enhancing inter-tie connections with other districts, installing additional fire hydrants in the woodland areas of the American Parkway, installing new valves on transmission mains to isolate damage, and purchasing additional portable generators. The Vulnerability Assessment lists the potential actions to be taken by the District in the event of a catastrophic emergency. The actions are summarized in Table 28.

Table 28 – Actions for Catastrophic Supply

Potential Responses to Hazards	Drought	Groundwater Contamination	Fire	Surface Water Contamination	Power Outage	Flood	Earthquake	Distribution System Failure
Well Improvements								
Well Replacement	X	X		X				
Well Additions	X	X		X				
Wellhead Treatment System	X	X		X				
Groundwater Protection Program	X	X		X				
Distribution System Improvements								
Enhanced Inter-ties		X	X	X	X	X	X	X
New Valves on Transmission Lines				X				X
Additional Fire Hydrants			X					
Valve Exercising Program				X				X
Pipeline Flushing Program				X				X
Emergency Repairs								
Additional Portable Generators					X			X
Efficiency Use Program	X							

Emergency Operations Plan (EOP)

Because the District receives a large portion of its supply from SJWD, the policies and actions defined in the SJWD Emergency Operations Plan (EOP) during a catastrophic occurrence will involve the District's cooperation. SJWD developed the EOP in September 2003 to provide guidelines on how to respond quickly and efficiently in the event of an emergency. The goal of the EOP is to restore water supply to customers as soon as possible after a hazard has occurred. Within the plan there are three levels of emergency:

- Level 1 – Everyday conditions; no EOP activation. This level requires internal resources of SJWD be prepared to resolve a low risk incident, if one should occur. Notification throughout the area may be necessary.
- Level 2 – Portions of the EOP may be activated; level two is implemented when an incident occurs that requires some external resources in addition to internal SJWD resources. Notification of various groups such as district management, police, and fire departments is required.
- Level 3 – Full EOP activation; level three is due to a full blown event requiring notification of internal and external resources.

Examples of a system wide hazard could be flooding due to levee failure, dam failure, or pipeline breakage; earthquakes; fires; hazardous material spill; and terrorism or civil defiance. During the activation of the EOP there are four phases to meet the needs of SJWD: 1) pre-emergency; 2) warning phase; 3) impact phase; and 4) recovery. The pre-emergency phase allows the district to train emergency staff by preparing plans, conducting emergency exercises, and arranging the necessary resources when needed. During the emergency period, the necessary staff and management should be notified. During the impact phase, the emergency operation center shall be open where staff will take the necessary steps defined within the EOP. The recovery phase will be addressed once the needs of the people have been met. The recovery phase will include the restoration of essential public services, private and public property, public services, and normal government/district operations.[50]

Prohibitions, Penalties, and Consumption Reduction Methods

In the occurrence of a drought, the District will select needed conservation practices in response to the drought condition and use appropriate public outreach to encourage all customers to reduce their water consumption during early phases of water conservation. Within the District's five stage water conservation plan there is detailed information regarding mandatory prohibitions, consumption reduction methods, and penalties and charges for those who do not comply. The mandatory prohibitions are listed in Table 29. The District anticipates achieving a 50 percent overall demand reduction once all consumption reduction methods are implemented as defined in Stage 5. The stages are listed in Table 26.

[50] San Juan Water District Emergency Operations Plan, September 2003.

Table 29 – Mandatory Prohibitions from the District's Water Shortage Contingency Plan

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Excessive runoff	1
Free-flowing hoses for all uses	1
Failure to repair leaks	1
Washing of streets, driveways, sidewalks, building	1
Surface Irrigation (during restricted hours) [during restricted days]	(1,2); [3, 4]; 5
Restaurants serve water upon request	2
Filling of pools, ponds, artificial lakes, fountains	4
Washing of vehicles (except on lawns)	(4); 5
Flushing of sewers or fire hydrants	5
Construction water	5
New connections	5

Note: The stage number in parentheses applies to the prohibition example also in the same type of parentheses listed in the first column and same row.

If the mandatory prohibitions listed in Table 29 are not met, the District may terminate service and require a reconnection charge for excessive visible waste. The District's reconnection charges range from $100 to $400 per service connection based on the number of times a reconnection is needed. Currently the District does not penalize its customers for excessive usage because the metering program is not complete. Once the District can evaluate individual usage by meter readings, the policy may change.

Analysis of Revenue Impacts of Reduced Sales During Shortages

In a fully metered system, negative impacts can be expected on revenues during a drought if demand reduction goals are met. Planning measures are needed to compensate for and to overcome revenue shortfalls. With a flat rate billing system, customers pay the same amount as others within their water use classification, regardless of amount used. Currently, the District has a flat rate system for its residential connections and therefore should experience no such revenue loss during water shortages. In fact, demand reductions should result in reduced expenditures for water (cost of surface water and cost of producing groundwater), possibly freeing up additional funds for conservation or other uses.

Mechanisms to Determine Actual Reductions in Water Use

Currently, the District cannot monitor individual residential customer's water usage because the metering program is not complete. However, a practical means of monitoring District-wide usage at the point of supply meters is available. Table 30 provides information on how the District records and determines actual reductions in water demands.

Table 30 – Water Use Monitoring Mechanisms

Stage	Monitoring Procedure
1, 2	District-wide usage figures are recorded weekly. Usage totals are formally reported to the General Manager and Board of Directors on a monthly basis.
3, 4, 5	District-wide usage figures are recorded weekly. Usage totals are reported to the General Manager weekly, who will report any significant discrepancy in reduction goals to the Board of Directors so that appropriate corrective action will take place. Usage reports will be formally presented to the General Manager and Board of Directors on a monthly basis.
Emergency Shortage	Production from all sources and pressures throughout the system will be continually monitored on a round the clock basis and reported to the supervisor in charge. Causes of concern will be reported to the General Manger and corrective action implemented. Reports will be provided to the Board of Directors.

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Section 8 – Water Recycling

This section provides information on recycled water and its potential for use as a water source in the District's service area. Currently recycled water is not used within the District; however, the District supports the use of recycled water regionally throughout the Sacramento area. Because the use of recycled water within the District has not changed since 2001, a significant portion of this section is repeated from the 2001 Plan. Where applicable, contents of the section were updated and additional information was provided.

Recycled Water in California

The demand for suitable water supplies will continue to increase as population within California reaches an estimated 52 million in the year 2030.[51] In order to account for the growing need, California has recognized the importance of recycled water in the management of the State's overall water supply. Recycled water augments the dependence on freshwater for uses such as irrigation, industrial uses, and agricultural uses. Reuse opportunities in California will increase in the future as technological improvements reduce treatment costs and public perception improves.

In April 2002, the 2002 Recycled Water Task Force (task force) was formed by DWR as directed by Assembly Bill No. 331. The task force identified the opportunities and the constraints for increasing the use of recycled water in California.[52] The task force identified 26 issues and provided general recommendations for actions that should be implemented by the State or local agencies to increase its recycled water usage. The task force estimated that California has the potential to increase its use of recycled water by 1.5 million acre-feet per year by 2030 if appropriate funding is made available.[53]

The Water Recycling Act of 1991 set California water recycling goals at 700,000 acre-feet a year by 2000 and 1 million acre-feet by 2010. The most recent survey conducted by SWRCB in 2002 indicates that the 2000 goal was not attained. Through the end of 2001, California's recycled water usage was estimated to be 525,000 acre-feet. Because of increased applications for recycled water, DWR believes that the 2010 goal will be met or even exceeded.[54] Uses of recycled water within California include agricultural irrigation, landscape irrigation and impoundment, groundwater recharge, recreational impoundment, seawater barrier, industrial use, and wildlife habitat. Agricultural and landscape irrigation are the largest uses of recycled water.

One of the recommendations from the task force was to increase funding opportunities. The SWRCB, through the Division of Financial Assistance, provides financial assistance for water recycling projects. The SWRCB promotes the use of recycled water by providing assistance in the form of low-interest loans and/or grants for construction and planning

[51] DWR, Water Recycling 2030, Recommendations of California's Recycled Water Task Force, June 2003.
[52] Draft California Water Plan Update 2005 Volume 2 – Resource Management Strategies. Chapter 16.
[53] DWR, Water Recycling 2030, Recommendations of California's Recycled Water Task Force, June 2003.
[54] DWR, Water Facts No 23 – Water Recycling, October 2004.

projects. Recently, the SWRCB accepted applications for approximately $42 million in construction grant funding provided by Proposition 50. The SWRCB received 45 applications totaling approximately $127 million; however, only 25 applications were complete for a total of $59 million. Of the 25 applications, 10 were for counties within Northern California and include projects within Glenn, Santa Clara, Contra Costa, Napa, Alameda, and San Mateo Counties.

Wastewater in Sacramento County

The Sacramento Regional Wastewater Treatment Plant (SRWTP), owned and operated by the Sacramento Regional County Sanitation District (SRCSD), collects and treats the wastewater generated from the Sacramento region. The regional plant serves the entire Sacramento metropolitan area including the unincorporated county area adjacent to the City of Sacramento, the City of Citrus Heights, the City of Elk Grove, the City of West Sacramento, and the City of Folsom. The service area covers 250 square miles and includes over 80 miles of interceptors conveying wastewater to the SRWTP.[55]

The SRWTP treats wastewater through secondary treatment and disinfection. The primary treatment includes screens, aerated grit chambers and sedimentation tanks. The secondary treatment process includes carbonaceous oxidation tanks and clarifiers. The final step includes the addition of chlorine for disinfection and sulfur dioxide to neutralize the chlorine prior to disposal. The treated wastewater is discharged to the Sacramento River south of the Freeport bridge.

The SRWTP receives and treats an average of 165 mgd of dry weather flow, however the treatment capacity is approximately 400 mgd to handle peak wet weather flows.[56] According to SRCSD staff, the average dry weather flow was 147 mgd in 2004. Currently, the permitted capacity of the SRWTP is 181 mgd of average day weather flow.[57] SRCSD has submitted an application to the RWQCB to renew their National Pollutant Discharge Elimination System (NPDES) discharge permit and increase the permitting capacity to the estimated 2020 average day weather flow of 218 mgd.

SRCSD has completed a 2020 Master Plan that provides a phased program of recommended facilities to accommodate planed growth while maintaining treatment reliability, meeting future regulatory requirements, and optimizing costs. The Final EIR for the 2020 Master Plan was certified in the summer of 2004. Because the 2020 Master Plan only projects out to 2020, future discharge projections are not available for 2025 and 2030. Table 31 projects the amount of treated wastewater (average dry weather flow) to be discharged to the Sacramento River through 2020. The 2020 Master Plan does mention that future average dry weather flows to the SRWTP are expected to reach 350 mgd at plant build-out.

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[55] SRCSD website, www.srcsd.com
[56] SRCSD brochure available online at www.srcsd.com
[57] Tetra Tech, Inc. Phase I Title XVI Feasibility Analysis for County Wide Water Recycling Program, 2002. Prepared for SRCSD and USBR.

Table 31 – Disposal of Treated Wastewater (non-recycled)

Year	Treated Wastewater Disposed to Sacramento River (mgd)
2005	174
2010	196
2015	210
2020	218

Source: SRCSD

Wastewater Generated in the District

Municipal wastewater is generated in the District's service area from a combination of residential and commercial sources. The quantities of wastewater generated are generally proportional to the population and the water use in the service area. Although SRCSD does not meter the amount of wastewater generated from within the District's service area, SRCSD was able to provide an estimate of wastewater flow based on parcel information. Individual parcels were provided to SRCSD to be used as input in SRCSD's hydraulic model.[58] Using existing and predicted land use information, SRCSD estimated wastewater flows for the existing and build-out situation. Estimates of the wastewater flows in the District are included in Table 32.

Table 32 – Wastewater Collected and Treated

Year	Wastewater Collected within the District (acre-feet/year)
2000	4,435
2005	5,020
2010	5,800
2015	6,580
2020	7,360
2025	7,360
2030	7,360

Note: Build-out is assumed to occur in 2020. Year 2010 was interpolated between the existing (2005) and build-out estimate.

Water Recycling by the SRCSD

In 1999, the SRCSD began construction of a 5 mgd water recycling plant as Phase I of the SRCSD Water Recycling Program. The water recycling plant further treats the secondary effluent from the SRWTP with sand filtration and disinfection to meet the recycled water demands in the vicinity of the SRWTP. The water recycling plant began producing and distributing disinfected tertiary water to the Elk Grove/Laguna area in April 2003. The recycled water is used at parks, schoolyards, business landscapes and streetscapes in the Laguna West, Lakeside, and Stonelake communities and for industrial uses at the SRWTP. Currently there are 40 user sites with additional connections planned for 2006. Phase I

[58] SRCSD's hydraulic model is called Infoworks by Wallingford Software.

recycled water usage has reached a peak operation of 3.0 mgd and average daily water recycling usage in the range of 1.0 – 1.5 mgd.[59]

The water recycling plant is capable of being expanded to 10 mgd to serve additional demand for landscape irrigation as Phase II. SRCSD is currently conducting pilot tests to evaluate the most efficient treatment technology to use in the expansion of the plant. The results of the pilot tests are anticipated in 2006. Most of the recycled water demand will be landscape irrigation for recent developments south of the plant within the Elk Grove/Laguna Community (East Franklin and Laguna Ridge developments). Phase II of the SRCSD Water Recycling Program is expected to be in service by 2008 – 2010.

In addition to the proposed 10 mgd water recycling plant, SRCSD is completing a Water Recycling Master Plan to plan for recycled water growth in the Sacramento area through 2030. SRCSD's Water Recycling Master Plan will be updated in 2006 and will discuss water recycling project alternatives that will enable SRCSD to meet a peak recycled water usage goal of 30 to 40 mgd.

Coordination of Recycled Water in Fair Oaks Water District

The SRCSD has taken steps to promote and expand the use of recycled water, but these steps to date have been focused on areas adjacent to the SRWTP. SRCSD has completed a number of recycled water studies including:

- Sacramento County Water Reclamation Study (August 1994) – This report identified recycled water markets within Sacramento County and facilities that would be needed to serve those areas.
- Plan of Study, Sacramento County Water Reclamation and Reuse Project (December 1997) – This study developed an approach to facilitate a countywide water recycling project between SRCSD and USBR.
- Appraisal Report for the Sacramento County Water Reclamation and Reuse Project (February 1998) – This report identified issues, constraints, and benefits related to implementing a large-scale water recycling program in Sacramento County.
- Title XVI Feasibility Analysis for Phase I Countywide Water Recycling Program (January 2002) – This report identifies water reuse opportunities within Sacramento County and provides a description and cost analysis of the alternatives.

Of the reports listed above, only the Sacramento County Water Reclamation Study prepared in 1994 evaluated the feasibility of recycled water use within the District.

[59] SRCSD, SRCSD Water Recycling Urban Water Management Plan Language, September 15, 2005.

Potential Uses of Recycled Water within the District

The Sacramento County Water Reclamation Study prepared in 1994 initiated an evaluation of the feasibility of recycled water use within the urban water districts of Sacramento County. Various markets for recycled water including agricultural irrigation, urban landscape irrigation, industrial water, groundwater recharge, and wetland enhancement were evaluated using economic and non-economic criteria. The report identified 27 users within the District that could utilize recycled water such as schools, parks, and churches. The total estimated demand was 806 acre-feet per year in 1994.[60] These demands do not include residential landscape irrigation. Although 27 users were identified within the District service area, it is possible some of the users receive water from sources other than the District such as private groundwater wells. If recycled water was used at these sites, the total water demand of the District would not be reduced.

Although a potential recycled water demand of 806 acre-feet was identified within the District, the number may be much less based on dedicated irrigation accounts. Since 2002, the District has reported 67 metered accounts for dedicated irrigation and 21 institutional accounts to the CUWCC. The total amount of water delivered to these users has ranged from 327 to 346 acre-feet.[61] The potential for recycled water demand is not anticipated to increase since the District is close to build-out and schools and parks are already in place.

Projected Future Use of Recycled Water within the District

The extent to which recycled water is available in the future in the District's service area depends on the growth of the SRCSD recycled water program. In the short-term, recycled water is not a viable option to reduce the District's total water demand because it is a significant distance from the source of recycled water at SRWTP. The cost of conveying recycled water to the District's service area from the regional plant would be prohibitively expensive.[62] Therefore, future use of recycled water within the District is not anticipated through 2030.

The only feasible way recycled water could be available to the District would be if SRCSD built a satellite water reclamation facility north of the American River. However, it is unlikely that satellite reclamation plants would be built in the foreseeable future as part of SRCSD's water recycling program. SRCSD is near completion on a recycled water master plan and there are no plans for a satellite treatment near the District. A satellite treatment plant near the District was also not recommended in the SRCSD's 2020 Master Plan.

Because SRCSD is not currently, nor in the foreseeable future, considering a water recycling program for the areas north of the American River in Sacramento County, it is not practicable to provide a recycled water optimization plan that includes actions to facilitate the installation of dual distribution systems and promote recycled water uses. Without plans by

[60] Nolte and Associates, Sacramento County Water Reclamation Study Volume 2, 1994.
[61] Annual Reports to CUWCC for 2002, 2003, and 2004.
[62] Nolte and Associates, Sacramento County Water Reclamation Study Volume 1, 1994.

SRCSD to construct satellite reclamation plants, use of recycled water to meet water demands in the District does not appear feasible.

2000 Projection Compared to 2005 Actual Use

Since the 2001 Plan, the recycled water supplies to the District have not changed. The projections for recycled water usage within the District in the 2001 Plan were consistent with actual use. Again, recycled water is not currently or anticipated to be used within the District.